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CONTENTS

83
Ser. A
Vol. 66-67
Subject Index
1963-64
N/C

List of Journals
Author Index
Subject Index
List of Subject Index Headings at end

LJ1
A1
S1

GENERAL	1	159	357	497	655	873	1107	1337	1577	1781	2013	2259
Units. Standards. Constants	—	159	357	497	—	873	1107	1337	1577	1781	2013	—
Education	1	159	357	497	655	873	1107	1338	1577	1781	2013	2259
MATHEMATICAL PHYSICS	1	159	357	497	655	874	1108	1338	1578	1781	2014	2259
Gravitation. Relativity	3	160	358	499	656	874	1109	1338	1578	1782	2015	2260
Quantum theory	5	162	360	500	658	876	1110	1340	1581	1784	2017	2262
Statistical physics	6	163	361	502	660	877	1112	1341	1582	1785	2019	2263
Transport processes	9	165	362	504	662	878	1114	1344	—	1786	2020	2266
MECHANICS	9	165	363	504	662	879	1115	1344	1584	1787	2021	2267
Mechanical measurements	10	166	363	505	663	879	1116	1345	1585	1788	2021	2268
FLUIDS	10	166	364	505	664	881	1116	1347	1586	1789	2023	2269
Mechanics of liquids	11	167	364	507	665	882	1117	1348	1587	1790	—	2269
Liquid state	12	168	364	507	666	884	1119	1350	1588	1791	2023	2272
Mechanics of gases	15	172	367	509	669	888	1122	1355	1592	1794	2035	2277
Gaseous state	17	173	367	510	669	889	1122	1356	1593	1795	2035	2277
Vacuum physics	18	174	369	511	672	892	1125	1359	1595	1796	2038	2279
VIBRATIONS. WAVES. ACOUSTICS	19	175	369	512	672	893	1126	1360	1596	1797	2039	2280
Vibrations. Elastic waves	19	175	369	512	672	893	1126	1360	1596	1797	2039	2280
Shock waves	20	176	369	513	673	895	1126	1361	1597	1799	2040	2282
Acoustics	21	177	370	513	675	895	1127	1362	1599	1801	2042	2282
Instruments and measurements	22	178	370	514	676	897	1128	1364	1600	1803	2042	2283
Noise. Architectural acoustics	—	—	—	514	676	897	1128	1365	1600	1804	2042	2284
OPTICS	23	179	371	515	676	898	1129	1367	1601	1805	2043	2284
Photometry. Colorimetry	24	179	371	515	—	898	1129	1367	1601	1805	2043	2284
Geometrical and instrumental optics	24	180	371	515	677	898	1129	1367	1601	1806	2044	2285
Spectroscopy	25	182	372	515	678	900	1132	1370	1605	1807	2045	2286
Physical optics	25	183	372	516	681	900	1133	1371	1606	1809	2047	2288
Photography	27	184	374	518	682	903	1135	1373	1609	1811	2048	2290
HEAT	27	185	375	518	682	904	1137	1375	1609	1812	2049	2291
Radiation	28	186	376	—	684	905	1140	1376	1610	1814	2052	2293
Change of state	29	186	376	519	684	905	1141	1377	1611	1814	2052	2294
Thermodynamics	30	188	—	520	685	906	—	1378	1612	—	2054	2296
Low-temperature physics	31	188	377	520	685	906	1142	1378	1612	1816	2055	2296
Liquid and solid helium	31	188	377	520	685	907	1142	1379	1612	1816	2055	2296
Superconductivity	32	189	378	521	686	907	1143	1379	1613	1817	2055	2297
ELECTRICITY AND MAGNETISM	34	190	380	523	687	909	1144	1382	1616	1821	2057	2299
Electrical measurements and circuits	34	190	380	523	687	909	1144	1382	1616	1821	2057	2299
Electrostatics. Dielectrics	35	192	382	—	687	910	1146	1385	1617	1823	2058	2303
Current electricity. Electrokinetics	35	192	382	524	688	911	1146	1386	1617	1823	2059	2303
Ionization	36	192	383	525	688	911	1147	1386	1617	1824	2059	2303
Electric discharges	36	193	386	526	691	913	1148	1388	1618	1826	2059	2305
Plasma	38	195	392	527	695	916	1150	1391	1619	1830	2062	2309
Plasma oscillations	40	199	397	530	706	921	1166	1395	1623	1835	2065	2312
Electron emission. Electron beams	40	200	398	530	708	922	1167	1396	1624	1835	2072	2314
Ion emission. Ion beams	43	204	401	532	709	926	1170	1401	1625	1841	2075	2318
Mass spectrometers	44	204	402	533	711	927	1171	1403	1626	1842	2078	2320
Particle accelerators	44	205	403	533	711	927	1171	1403	1626	1843	2079	2320
X-ray tubes and techniques	45	206	403	541	711	928	1172	1404	1628	1844	2080	2322
Magnetism	45	206	404	542	712	929	1173	1405	1628	1844	2081	2323
Electromagnetism. Magneto-hydrodynamics	46	208	405	542	712	930	1173	1408	1630	1846	2083	2323
Electromagnetic waves and oscillations	47	210	406	544	714	932	1175	1410	1631	1848	2086	2326
• Radiofrequency spectroscopy techniques	50	212	407	550	717	935	1177	1412	1633	1850	2087	2328
Masers	—	213	408	550	717	935	1178	1413	1634	1851	2089	2330
NUCLEAR PHYSICS	51	213	408	551	719	938	1180	1415	1636	1853	2092	2332
Apparatus. Particle detectors	51	213	408	551	719	938	1180	1415	1636	1853	2092	2332
Track visualization	52	215	409	552	719	939	1182	1417	1638	1855	2093	2334
Nuclear field theory	52	216	410	552	720	940	1182	1418	1642	1857	2093	2336
Elementary particles	55	220	413	557	725	944	1186	1424	1647	1862	2097	2344
Photons	55	—	414	557	725	945	—	1425	1647	1862	2097	2344
X-rays	—	—	—	558	—	—	—	—	—	—	—	2098
Neutrinos	55	221	415	558	725	946	1187	1427	1648	1863	2098	2345
Electrons	56	221	415	558	726	946	1187	1427	1648	1863	2098	2346
Nucleons	56	222	416	559	727	947	1188	1428	1650	1864	2099	2347
Protons	56	223	416	559	728	948	1189	1429	1651	1864	2100	2348
Neutrons	56	224	417	560	729	949	1189	1430	1652	1866	2102	2350
Mesons	57	226	418	561	730	950	1191	1430	1653	1868	2103	2351
Hyperons	59	229	421	565	735	954	1193	1434	1657	1871	2107	2355
Deuterons	59	229	422	—	736	955	1194	1435	1657	1872	2108	2356
Tritons	—	229	423	566	—	955	—	1435	—	1872	2108	—
Alpha-particles, He nuclei	59	230	423	566	736	955	1194	1435	1658	1872	2108	2356

Continued on next page

CONTENTS

NUCLEAR PHYSICS (contd)												
Cosmic rays	59	230	423	566	736	955	1195	1436	1658	1872	2109	2357
Nucleus	60	231	429	568	739	957	1196	1437	1660	1875	2112	2358
Energy levels. Excited nuclei	61	233	430	571	740	960	1199	1439	1662	1877	2114	2360
Nuclear decay. Radioactivity	62	235	431	573	745	965	1202	1442	1664	1880	2117	2363
Nuclear reactions	64	238	434	575	748	970	1206	1446	1667	1883	2120	2366
Due to photons	64	238	—	576	749	970	1207	1446	1667	1884	2121	2367
Due to electrons	—	239	435	—	750	971	1207	1447	1667	1884	2122	2367
Due to nucleons	65	239	435	577	751	971	1207	1448	—	—	2122	—
Due to protons	—	239	435	577	751	971	1207	1448	1667	1885	2122	2367
Due to neutrons	—	241	436	579	753	973	1209	1450	1669	1886	2124	2369
Due to mesons and hyperons	—	243	437	581	754	974	1211	1451	1670	1887	2126	2371
Due to deuterons	65	243	438	581	754	975	1211	1451	1670	1888	2126	2371
Due to alpha-particles, He nuclei	66	243	438	582	755	976	1211	1452	1670	1889	2127	2372
Due to other particles and nuclei	66	245	439	582	755	977	1212	1452	1671	1889	2128	2372
Nuclear fission	66	245	439	583	756	977	1212	1453	1671	1890	2128	2373
Thermonuclear reactions. Nuclear fusion	—	—	—	584	—	978	1212	1454	—	—	2129	2374
Nuclear power studies	67	245	439	584	757	978	1213	1454	1672	1891	2129	2374
ATOMIC AND MOLECULAR PHYSICS												
Atoms	68	249	441	586	759	981	1216	1456	1673	1892	2131	2378
Isotopes	69	—	443	—	764	—	1219	1459	—	—	2135	2382
Mesic atoms	70	253	444	589	764	985	—	1460	1675	—	2136	—
Molecules	70	253	444	589	764	985	1220	1460	1676	1896	2136	2382
Structure. Internal mechanics.												
Spectra	70	253	444	589	764	985	1220	1460	1676	1896	2136	2382
Magnetic resonances	71	259	448	593	771	991	1226	1465	1682	1901	2142	2388
Dissociation. Free radicals	72	260	448	594	772	992	1227	1467	1683	1902	2144	2389
Intermolecular mechanics	72	261	449	595	773	992	1228	1467	1683	1903	2144	2390
Macromolecules. Polymers	—	262	449	596	774	992	1229	1468	1683	1903	2145	2390
Mesic molecules	—	263	450	—	—	—	1229	—	—	—	—	2390
SOLID-STATE PHYSICS												
Lattice mechanics	72	265	450	598	776	995	1232	1470	1685	1907	2147	2393
Thermal properties	73	267	452	599	778	997	1233	1471	1687	1910	2150	2394
Electron states	76	268	453	600	779	999	1235	1473	1689	1912	2151	2397
Defect properties	77	272	455	602	783	1002	1237	1476	1691	1914	2153	2401
Diffusion	—	276	457	603	786	1005	1240	1478	1697	1920	2165	2403
Colour centres	80	277	458	604	788	1006	1242	1479	1699	1922	2168	2404
Radiation effects	80	278	458	605	788	1007	1242	1480	1699	1924	2170	2405
Electrical properties of solids	81	279	459	606	791	1008	1243	1481	1700	1924	2175	2407
Metals	82	279	459	606	791	1009	1244	1481	1701	1924	2175	2407
Semiconductors	83	280	460	606	793	1010	1245	1484	1702	1926	2177	2409
Semiconductor materials	84	281	460	607	793	1014	1246	1485	1704	1928	2178	2410
Semiconductor devices	86	286	461	610	796	1023	1248	1488	1709	1932	2181	2413
Dielectrics	88	287	462	610	797	1025	1250	1489	1711	1934	2182	2414
Photoconductivity. Photovoltaic effects	89	288	463	611	799	1027	1253	1491	1713	1936	2186	2417
Thermoelectric properties	90	289	464	—	799	1028	1253	1492	1715	1939	2187	2417
Optical properties of solids	90	290	464	612	800	1029	1254	1492	1716	1939	2188	2418
Luminescence	92	293	466	615	803	1037	1259	1497	1720	1946	2195	2422
Magnetic properties of solids	96	298	467	617	805	1041	1261	1500	1723	1950	2198	2424
Magnetic resonances	115	305	470	621	811	1049	1267	1521	1730	1957	2204	2430
Mechanical properties of solids	120	310	472	624	816	1052	1270	1527	1733	1962	2211	2434
Structure of solids	125	313	474	627	821	1060	1277	1530	1739	1971	2221	2439
Crystallography	125	314	475	629	821	1061	1278	1531	1739	1972	2223	2440
Crystal lattice structures	127	316	476	629	823	1064	1281	1534	1744	1974	2227	2442
Alloys. Metallurgy	134	318	478	631	828	1067	1287	1537	1748	1979	2230	2446
Other solid forms	136	322	480	634	832	1070	1291	1540	1750	1984	2232	2450
Surfaces. Films. Adsorption	136	322	480	634	832	1071	1292	1541	1751	1985	2233	2450
Microstructure examination	138	324	481	636	834	1073	1294	1543	1754	1987	2236	2452
PHYSICAL CHEMISTRY												
Thermochemistry. Reactions	139	325	481	637	835	1074	1296	1544	1756	1990	2238	2454
Electrochemistry	139	325	481	637	835	1074	1296	1544	1756	1990	2238	2454
Photochemistry. Radiation chemistry. Radiochemistry	139	327	482	638	837	1075	1297	1546	1757	1992	2239	2456
Dispersions. Colloids	140	327	483	639	838	1076	1299	1547	1759	1993	2239	2457
Physical methods of chemical analysis	140	329	483	639	839	1077	1299	1548	1759	1993	2240	2457
	141	330	483	641	840	1077	1300	1548	1760	1993	2240	2458
GEOPHYSICS												
Atmosphere	141	330	483	641	841	1078	1301	1548	1760	1993	2241	2459
Upper atmosphere. Ionosphere	143	332	484	642	843	1080	1303	1550	1762	1995	2243	2460
Geomagnetism	146	335	486	644	848	1083	1306	1553	1765	1997	2245	2466
ASTROPHYSICS	148	339	488	646	854	1088	1320	1560	1769	2000	2249	2468
Radioastronomy	151	340	488	647	856	1090	1323	1562	1771	2001	2250	2470
Space research	—	348	—	651	866	1100	1330	1572	1776	2006	2255	2471
	—	349	—	652	869	1102	1332	1573	1778	2007	2257	2473
BIOPHYSICS. PHYSIOLOGICAL PHYSICS												
Hearing. Speech	155	350	493	652	870	1103	1332	1574	1779	2008	2257	2474
Vision	155	351	493	653	870	1103	1332	1574	1779	2008	—	2474
TECHNIQUE. MATERIALS	156	355	493	653	871	1104	1334	1575	1780	2011	2257	—
	158	356	496	654	872	1106	1335	1576	1780	2012	2258	—

English Letters	Languages	Cyrillic Letters	English Letters	Languages	Cyrillic Letters
a	R S B	А а	p	R S B	П п
b	R S B	Б б	r	R S B	Р р
ch	R S B	Ч ч	s	R S B	С с
d	R S B	Д д	sh	R S B	Ш ш
e	R S B	Е е	shch	R	Щ щ
ë	R	Ё ё	sht	B	Ъ ъ
é	R	Э э	t	R S B	Т т
ê	R B	Ѣ ѣ	t'	R B	Ѥ ѥ
f	R S B	Ф ф	t'	S	Ѧ ѧ
g	R S B	Г г	th	R	Ѩ ѩ
i	R S B	И и	ts	R S B	Ц ц
ī	R	І і	t-s	R S B	ТС тс
ī	R B	Й й	u	R S B	У у
j	S	Ј ј	ū	B	Ѣ ѣ
j'	S	Ѣ ѣ	ū	B	Ѥ ѥ
k	R S B	К к	v	R S B	В в
kh	R S B	Х х	y	S	Ј ј
l	R S B	Л л	ȳ	R	Ы ы
l'	R B	Љ љ	ÿ	R	Ѧ ѧ
l'	S	Љ љ	ya	R B	Я я
m	R S B	М м	yu	R B	Ю ю
n	R S B	Н н	z	R S B	З з
n'	R B	НЬ нь	zh	R S B	Ж ж
n'	S	НЬ нь	'	R	Ѣ ѣ
o	R S B	О о	'	R B	Ѥ ѥ

The use of l', n' and t' in Russian and Bulgarian (where they are not transliterations of a single letter, but merely l, n or t followed by the soft sign) is included to emphasize the fact that they are used for single letters only in Serbian.

Shch and sht invariably represent the letter Щ, in Russian and Bulgarian respectively, since the pairs of letters (ЩЧ in Russian and ЩТ in Bulgarian) seem never to occur consecutively in the respective languages.

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 P.I.Zorkoczy, M.Sc., A.R.C.S.T.

ERRATA

Author Index (1961) p. 2212, col.b, insert entry:

"Korobeinikov, V.P. and Ryazanov, E.V.
 Construction of accurate discontinuous
 solutions of the one-dimensional gas-dynamic
 equations and their application, 1 = 15912".

- Abstr. 4164 (1962) line 3: for "E. Lafitte" read "E. Laffitte".
 Abstr. 12364 (1962) line 3: for "218-86" read "218-43".
 Abstr. 13358 (1962) line 3: for "287-331" read "287-336".
 Abstr. 13518 (1962) line 3: for "38-61" read "37-62".
 Abstr. 15171 (1962) line 3: for "65-96" read "63-98".
 Abstr. 17039 (1962) line 7: for "(Pb,Zr)TiO₃" read "Pb(Zr,Ti)O₃".
 Abstr. 17438 (1962) line 3: for "396-429" read "395-440".
 Abstr. 17586 (1962) line 3: for "Vol. 15" read "Vol. 14".
 Abstr. 18512 (1962) line 3: for "442-515" read "441-524".
 Abstr. 19666 (1962) line 7: after "motion" insert "of its source".
 Abstr. 19679 (1962): Title retranslated, see Abstr. 7304 (1963).
 Abstr. 20639 (1962) line 3: for "(June, 1962)" read "(July, 1962)".
 Abstr. 21249 (1962) line 9: for "66 cm⁻¹ (ω)" read "66 cm⁻¹ (ω)".
 Abstr. 21265 (1962) line 8: for "gaving" read "having".
 Abstr. 21469 (1962) line 3: for "W.V.Engelhardt" read "W.v.Engelhardt".
 Abstr. 21492 (1962) line 4: for "486" read "487".
 Abstr. 21634 (1962) line 2: for "FULL VELOCITY" read "FALL VELOCITY".
 Abstr. 21814 (1962) line 2: for "K.C.Shekhar" read "C.S.Kaushik".
 Abstr. 22154 (1962) line 7: for "change" read "charge".
 Abstr. 22339 (1962) line 6: for "heating" read "having";
 line 10: (formula): for "K(r)" read " $\kappa(r)$ "; for "N" read "n";
 line 11: for "Kr" read " $\kappa(r)$ ".
 Abstr. 22467 (1962) line 3: for "H.Weiss" read "R.Weiss".
 Abstr. 22474 (1962) line 9: for "reactor" read "detector".
 Abstr. 22961 (1962) line 1: for "B³ π g" read "B³ π _g";
 line 6: for "A³ π g" read "A³ π _g".
 Abstr. 23525 (1962) line 3: for "M.C.Chetkin" read "M.V.Chetkin".
 Abstr. 23613 (1962) line 7: for "30kV" read "20kV".
 Abstr. 8 (1963) lines 5 and 6: for "2" read "z".
 Abstr. 84 (1963) line 7: for "leaded" read "loaded".
 Abstr. 472 (1963) line 3: for "633-46" read "632-45".
 Abstr. 783 (1963) line 7: for "iridium" read "indium".
 Abstr. 875 (1963) line 11: for " α " read " σ ";
 line 14: for " δ " read " σ ".
 Abstr. 935 (1963) line 9: for " λ^{3-2} " read " $\lambda^{3/2}$ ".
 Abstr. 1216 (1963) lines 20 and 22: for " ν " read " γ ".
 Abstr. 1247 (1963) line 2: for "A. Plyubchenko" read "A. P. Lyubchenko";
 line 16: for " ν " read " γ ".
 Abstr. 1505 (1963) line 3: for "647-55" read "646-54".
 Abstr. 1535 (1963) line 4: for "656-62" read "655-61".
 Abstr. 1729 (1963) line 3: for "M.I.Bogatskii" read "M.I.Bagatskii".
 Abstr. 1759 (1963) line 13: for "6.8 mm dia.," read "6.8 mil dia.,".
 Abstr. 2122 (1963) line 11: for "transmitter" read "transmitted".

ERRATA

- Abstr. 2633 (1963) line 15: for "compounds" read "components".
 Abstr. 2726 (1963) line 9: for "identified" read "identical".
 Abstr. 2764 (1963) line 7: for "radium" read "radius".
 Abstr. 3010 (1963) line 7: for " 1615 cm^{-1} " read " 1618 cm^{-1} ".
 Abstr. 3015 (1963) line 10: the second " a_2 " should read " a_4 ".
 Abstr. 3124 (1963) line 9: after "temperature" insert "of the spontaneous magnetization".
 Abstr. 3296 (1963) line 3: for "V. Ya. Shrednik" read "V. N. Shrednik".
 Abstr. 3554 (1963) line 9: for "D. B. Barber" read "D. R. Barber".
 Abstr. 3800 (1963) lines 6 and 17: for "acetyl" read "cetyl".
 Abstr. 3878 (1963) line 9: for "difference" read "different".
 Abstr. 3906 (1963) line 14: for " $(\pi E)^2$ " read " $(\pi E^2)^{-2}$ ".
 line 15: for " E^2 " read " E ".
 Abstr. 3910 (1963) line 14: for "7037" read "7087".
 Abstr. 3914 (1963) line 3: for "647-58" read "640-51".
 Abstr. 3942 (1963) line 2: for "OXIDE" read "WIDE";
 line 5: for " cm^4 " read " cm^2 ".
 Abstr. 4936 (1963) line 6: for "let" read "lead".
 Abstr. 5003 (1963) line 5: for "file" read "full".
 Abstr. 5090 (1963) line 10: for the second "+" read "=".
 Abstr. 5102 (1963) line 7: for "F" read "7".
 Abstr. 5272 (1963) line 2: for "R. Brissenden" read "P. Brissenden".
 Abstr. 6912 (1963) line 3: for "J. Tetlow" read "J. Teltow".
 Abstr. 6952 (1963) line 3: for "211-33" read "214-33".
 Abstr. 7084 (1963) line 3: for "32" read "321".
 Abstr. 7418 (1963): before line 1 insert "7418 BARIUM TITANATE CERAMICS FOR FINE-MOVEMENT".
 Abstr. 7712 (1963) line 2: for "this" read "their".
 Abstr. 9341 (1963) line 8: for " δ_1 ", " $\delta^{(2)}$ " read " ∂_1 ", " $\partial^{(2)}$ ".
 Abstr. 10022 (1963) line 4 from bottom: for " $f\rho_k$ " read " $f\rho_k$ ";
 line 3 from bottom: for " x_k and ρ_k " read " x_k and p_k ".
 Abstr. 10378 (1963) line 21: for " $l <$ " read " $l >$ ".
 Abstr. 10513 (1963) line 3: for "147-9" read "417-19".
 Abstr. 10538 (1963) line 8: for "band" read "bond".
 Abstr. 10621, 10969, 10970, 10979, 10980, 10993, 10994, 10995, 10996, 11997, 11004, 11007, 11011, 11014, 11015, 11016, 11019 (1963): for "Vol. 2, No. 13" read "Vol. 13, No. 2" and insert "[Luminescence Symposium, Prague, 1962 (see Abstr. 10977 of 1963)]" at the end of the journal reference.
 Abstr. 12834 (1963) line 7: for " d_3 " read " α_3 ".
 Abstr. 12876 (1963) line 10: for " $\frac{1}{2}\pi$ " read " $\frac{1}{2}\pi$ ".
 Abstr. 13435 (1963) line 4: for "338" read "333".
 Abstr. 13621 (1963) last line: for "1934" read "1954".
 Abstr. 13982 (1963) line 3: for "333" read "338".
 Abstr. 14689 (1963) line 2 from bottom: insert "=" after " γ ".
 Abstr. 15521 (1963) line 8: for " Al_2O_3 " read "Al".
 Abstr. 15793 (1963) line 6: for " (I_s/\sqrt{K}) " read " $(I_s/\sqrt{K})^2$ ".
 Abstr. 15946 (1963) line 7: insert "+" after end of first bracket.
 Abstr. 16301 (1963) line 7: for "26-27" read "26-27".
 Abstr. 16309 (1963) line 5: for "water" read "Wales";
 line 8: for "attained" read "obtained".
 Abstr. 16594 (1963): in last line add "H. H. Hodgson".
 Abstr. 16622 (1963) last line: insert "are" before "verified".
 Abstr. 16823 (1963) line 2 from bottom: for "Lionville" read "Liouville".
 Abstr. 17700 (1963) last line: for "actuation" read "activation".
 Abstr. 21122 (1963) line 4: for "planet-aries" read "planetaries".
 Abstr. 21127 (1963) for "D. B. Barber" read "D. R. Barber".

SUBJECT INDEX

INTRODUCTION

The entries in this index refer to the abstracts by their serial number, not by the page number. The entries are grouped under headings (printed in bold type, e.g. "**Abrasion**") which represent, in the main, general categories or concepts rather than specific names. If a heading for a particular subject does not appear, a more general heading should be consulted; for example, "Zone plates" would be listed under "**Diffraction**"; "Barkhausen discontinuities" under "**Magnetization process**". There are numerous cross-references directing attention to related headings in other parts of the index.

Many of the headings are subdivided by the use of subheadings, which are indented (i.e. printed slightly to the right) and commence with a small letter (for example, see the subheadings under "**Absorption**").

ARRANGEMENT OF HEADINGS AND SUBHEADINGS

The headings are arranged throughout the index in alphabetical order according to British Standard 1749:1951 (the "word by word" system, not "reading right through"). The subheadings, with a few exceptions, are themselves arranged in alphabetical order under their respective headings. The exceptions (for example, see the subheadings under "**Spectra**", "**Crystal structure, atomic**") are cases where a more logical order is preferable to a purely alphabetical one.

ARRANGEMENTS OF ENTRIES UNDER HEADINGS

Entries are arranged in two alphabetical groups as follows. First group: generalities and named substances (in words); second group: named substances (chemical formulae). If a search is being made for a particular substance, both the first and second alphabetical groups should be inspected since, for example, alumina may also be listed as Al_2O_3 .

COLLECTED LIST OF SUBJECT HEADINGS

The alphabetical arrangement of the headings is the most convenient for locating a known heading quickly, but there may be other related headings elsewhere in the index of which the reader is unaware, and which he would only come across by accident. To assist the reader to discover all the headings appropriate to his subject, a collected list of the headings is given at the end of the index, which should be consulted as a matter of routine each time a search is made. In this list, the headings are not arranged in alphabetical order, but are grouped into sections by subject on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. By using this list, the reader can quickly determine which are the headings appropriate to his subject, and they are then easily found in the main index in their alphabetical position.

HEADINGS WITH NO ENTRIES

Because physics is a developing subject, it is not possible to maintain the list of headings unchanged from year to year; it is subject to a continuous process of revision, with the introduction of new headings and subheadings, and the alteration and elimination of old ones. This process is a gradual one, however, and the great majority of the headings are the same as those of the previous year. To assist in maintaining the continuity of the index, all the headings in current use are printed each year, even those for which there are no abstracts to be recorded in the present volume. The latter are followed by the announcement "No entries this year"; this supplies confirmation that these headings have not been dropped from the index, and entries may reappear under them next year.

ELEMENTS, COMPOUNDS AND OTHER SUBSTANCES

The names of elements, their compounds, a few compounds of special interest (e.g. "**Water**") and a few common materials (e.g. "**Wood**", "**Paper**") are included as headings. Under these, as well as under the appropriate "subject" headings, are listed any abstracts which contain significant physical information about the element, compound or substance named; except, however, that abstracts listed under headings referring to nuclear properties, including radioactivity, are not necessarily also listed under the substance name. The entries under these headings are themselves arranged in alphabetical order of substance or nuclide names, so that a given substance can be readily located.

Inorganic compounds of the elements are listed under the first element in the chemical formula, and all the compounds of a given element are grouped under a single heading (e.g. "**Sodium compounds**"). Alloys are listed under the first constituent, e.g. Cu-Ni alloys under "**Copper compounds**". Organic compounds are grouped under "**Organic compounds**", "**Polymers**", "**Plastics**" and under special substance headings such as "**Paper**", "**Proteins**", etc.; all the latter are listed in the collected list of headings at the end of the index.

BEFORE USING INDEX, CONSULT LIST OF SUBJECT HEADINGS PRINTED AT THE END

Abacs

See Nomograms.

Aberrations, optical

See also Electron lenses; Ion optics; Optical instrument testing; Optics, geometrical; Particle optics.

- analysis, use of quasi-invariants 3=1801
 astigmatism and coma in spectacle lenses 3=11886
 astrograph objective, coma, rel. to star positions on photo. plate 3=3524
 Buchdahl's coeffs., normalized, of 5th order 3=238
 coefficients of higher orders, rel. to design 3=16734
 concentric corrector, errors, detailed analysis 3=1795-6
 concentric systems, algebraic theory to all orders 3=1794
 concentric systems, spherical aberr. 3=14313
 contrast transmission function, fall-off 3=7308
 crossed cylinders, spherical, diffraction patterns 3=3868
 decentration and centring state defin. 3=16740
 decentring tolerances, computation 3=1791
 doublet, cemented, principal point, object side 3=18962
 eyepiece, Ramsden, colour correct., calc. 3=18964
 geometrical optics 3=257
 imperfect systems, rel. to image contrast 3=1797
 lenses, longitudinal, meas. in extra-axial region 3=237
 lenses, photographic, triplet, objective, design control 3=24069
 lenses, semiautomatic design by computers 3=14311/2
 lenses, theory, rel. to automatic design 3=16733
 microscope objective, monochromat u.v., correction 3=1793
 objectives, ultra-rapid, corrections 3=16814
 optimum corrections for optical systems 3=14319
 $\frac{1}{4}\lambda$ spherical aberrn., diffrn. pattern 3=264
 in Schwarzschild universe 3=14011
 Seidel, derivatives w.r.t. system parameters 3=3867
 spectral line images, Strehl-intensity tolerances 3=21547
 spherical, coma, specified, design for single lenses 3=9578
 spherical, rel. to refractive index 3=1792
 superachromatic lenses, design 3=14309
 surfaces of revolution free from sine aberration 3=21519
 symmetrical systems, brightness coma and diaphragm coma 3=7307
 telescopes, anamorphic, four-lens 3=7309
 telescopes, geodetic, achromatism 3=14328

Abrasion

See also Hardness.

- brittle single crystals, friction and wear 3=11188
 diamond, hardness, effect of neutron irradi. 3=3248
 diamond, mechanism 3=25645
 logistic growth function for comminution 3=8786
 steel, case-hardened layer, resistance to 3=1247
 Bi, wear and friction, effect of brittle fracture 3=13386
 Co-CW alloy, surface fracture mechanism 3=5075
 Cu, by carbon brushes 3=20761
 In on In sliding, metal transfer and wedge-forming mechanism 3=13385
 NaCl, dislocation processes at surface 3=8785
 Sb, wear and friction, effect of brittle fracture 3=13386
 Si, electron microscope study of damaged layer 3=3353
 Si, surface damage 3=16010
 Si, surface damage 3=18419

Absorption

See also Alpha-rays, absorption; Beta-rays, absorption; Cosmic rays, absorption; Electrons, absorption; Gamma-rays, absorption; Hyperons, absorption; Mesons, absorption; Neutrons and antineutrons, absorption; Protons and antiprotons, absorption; Sorption; X-ray absorption

- exponential, n obs., optimum design of expts. 3=5328
 selective, meas. using i.r. spectrometer 3=9598
 CO, onto Pt (100), (110) faces, structure exam. 3=6899
 N₂, by W, effect on surface potential 3=12225-6

acoustic waves

See also Noise abatement; Transmission, acoustic waves.

- acoustic streaming theory. 3=214
 in air, audio-frequency, rel. to humidity 3=7241
 air, rel. to architectural acoustics 3=14302
 air, relaxation mechanisms 3=18860

Absorption—contd**acoustic waves—contd**

- atmosphere, 200-2000 c/s atten. 3=16232
 binary alloys, effect of addition of third element 3=23489
 cavities, with velocity and thermal boundary layers 3=11864
 coefficient of absorbent material, dependence on area 3=11865
 crystals, including mol. rot. degrees of freedom 3=8352
 cyclohexane, solid, reson. 3=8352
 damping formulae from electron-vibration interaction, rel. to mag. field 3=4821
 duct, lined, relation to lining absorpt. 3=18918
 ear-protecting devices 3=16453
 emulsions and drops, attenuation of sound 3=14261
 ferromagnetic dielects, effect of paramag. impurities 3=22654
 flexibly supported absorbers 3=9572
 in flow channels, high wind vel. 3=18920
 gases, imperfect, classical calc. 3=18856
 ice, rel. to lattice defect behaviour 3=10644
 liquids, viscous and scattering, light, depolarization factor 3=21360
 meas., coeff., in small reverberant rooms 3=14280
 meas., very active substances 3=9458
 measurement, reverb. chamber techniques 3=14279
 metals in mag. field, quantum theory 3=4813
 metals, nuclear acoustic resonance absorpt. 3=20088
 metals, rel. to conduction electron props. 3=10593
 ocean, low freq. attenuation. 3=25862
 in ocean, rel. to eddy viscosity 3=9558
 plasma, thermal, magnetoacoustic waves 3=24327
 porous materials 3=23983
 by rectangle of absorptive material 3=18927
 resonators, slit, equivalent circuit analysis 3=18928
 Rochelle salt, near upper Curie pt., frequency depend. 3=2728
 in sea-water, viscous-relaxation theory 3=21029
 semiconductors 3=17649
 semiconductors, piezoelectric 3=17653
 by superconductors 3=330
 supersonic waves, magnetohydrodynamic 3=3853
 wedges, phenopolyurethane 3=16717
 by wire meshes, calc. 3=7225
 in woods, deciduous and evergreen 3=18926
 zero-sound damping in Fermi liquid, theory 3=5438
 Ar gas 3=9505
 Br, liquid and solid 3=9458
 Cd, in mag. field, rel. to temp. 3=10623
 Cr alum, paramag., nonresonant 3=22652
 He, below λ -point, rel. to velocity 3=3941
 He, liquid, zero to boiling point 3=5572
 He³-He II, first-sound coeff. 3=3943
 MgSO₄, aqueous soln., relax. theory 3=23879
 N₂, effects of water vapour 3=18860
 N gas 3=9505
 Na, nuclear acoustic resonance 3=20088
 O₂, effects of water vapour 3=18860
 O₂ gas 3=9505
 O₂ gas 3=9506
 SO₂ solns., 2-15Mc/s, errata 3=5439
 Sn, longit., by conduction electrons 3=10593
 Zn, in mag. field, rel. to temp. 3=10623
- acoustic waves, ultrasonic**
 alkali halide crystals, irradiated, rel. to stress/strain relationships 3=22649
 attenuation meas., effect of nonparallel sample faces 3=23984
 calcium acetate, in soln., dissoc. rate, errata 3=5439
 collodion-water suspension with air bubbles 3=14262
 cyanide ion hydrolysis rate meas. 3=8952
 esters, liquid, 24, var. with freq. (5-20 Mc/s) and temp., 3=14155
 ferrites 3=13278
 interferometer meas. 3=224
 liquids, containing glass "microballs" size and surface tension effects 3=16621
 in liquids, dielec., meas. with thermoelectric probe 3=1862
 liquids, meas., small values (≈ 0.01 dB/cm) 3=14160

Absorption—contd

acoustic waves, ultrasonic—contd

- liquid mixtures, binary associated, excess, theory 3=21359
- liquids, pulse apparatus and solution data 3=230
- longitudinal attenuation, Coulomb interact. effects 3=4814
- magnesium acetate, in soln. dissoc. rate, errata 3=5439
- metal in mag. field, frequ. variation, quantum oscill. 3=22653
- metals, in elec. and mag. fields 3=2722
- metals, in mag. field, quantum oscillations 3=4816
- metals, u.s. attenuation 3=22651
- organic compounds, liquid-polycrystal transition region 3=21355
- in paramagnetic salts and metals 3=20097
- plasma, in crossed elec. and mag. fields 3=9778
- in solids, review 3=10594
- solids, saturation effect on nuclear magnetization 3=25588
- solutions, rel. to light scatt. and diffusion 3=21368
- strontium acetate, in soln., dissoc. rate, errata 3=5439
- superconductors, anisotropy 3=5586
- superconductors, anisotropy effects, near threshold freq. 3=3944
- superconductors, atten. for $q\ell < 1$, calc. 3=21654
- superconductors, theory 3=14444
- tissue of central nervous system 3=1549
- transition metal complexes, resonance absorption, with inversion splitting 3=25195
- transverse attenuation, Coulomb interact. effects 3=4815
- water, meas. by radiation pressure method 3=21361
- water vapour, 1-50 (Mc/s) atm⁻¹, relaxation time 3=18857
- Al, stress effects, time var., 15-200 Mc/s. 3=22648
- Al, superconducting, shear waves 3=14446
- CoSO₄, solutions, aqueous, 0.025-2.2 mole/litre, 0.2-2 Mc/s, and dissociation 3=14160
- CO₂, effect of H₂ and D₂ on relaxation time 3=16658
- Cd, single-crystal, 5-60 Mc/s range 3=12920
- Ge, n-type, and electron and hole scatt. 3=13063
- H₂, para, 25.2°C, and relax. time for rot. degrees of freedom 3=14213
- H₂S, 25°C, 10⁶ - 2 x 10⁹ c/s atm., and relax. time for rot. degrees of freedom 3=14213
- He II, liq., quantum hydrodynamics 3=7399
- Mg, 5-75 Mc/s, 4-2° - 300° K 3=8353
- Mg and Mg alloys, low-temp. attenuation, rel. to Bordoni peaks 3=22650
- MgO, non-linear, 9 Gc/s, on <100> axis 3=20096
- N₂, relaxation time, 22° C 3=18857
- N₂O₄, dissociation rate meas. 3=4784
- NaCl, method for dislocation meas. 3=15491
- Nb-Zr alloys superconducting, oscillatory behaviour 3=12035
- O₂, relaxation time, 22° C 3=18857
- in Pb, attenuation 3=4819
- Pb, effect of longitudinal mag. fields 3=25192
- Sb, in mag. field, de Haas-van Alphen oscill. 3=4818
- Sb, in mag. field, geometric resonance 3=4817
- Si, p-type, and electron and hole scatt. 3=13063
- SiO₂ glass, effect of fast-neutron irradiat. 3=13330
- SiO₂ glass, low-temp. rel. to structural defects 3=767
- Sn, effect of longitudinal mag. fields 3=25192
- U and grains, unrefined, detection, pulses 3=13496
- Zn acetate aq., rel. to temp. 3=3803
- Zn, quantum oscillation 3=2723

electromagnetic waves

See also Spectra, radiofrequency.

antiferromagnetic medium, plane wave

soln. 3=25549

aurora 3=510

auroral, at 30 Mc/s 3=13805

in auroral region, rel. to trapped energetic

electrons 3=13812

auroral zone, short duration event 3=18561

Beer's law, and optimum transmittance parameters 3=24041

in cloud of charged particles 3=9731

CN radical, rel. to B^Σ+ level populations 3=6390

cosmic-noise, in ionosphere 3=7723

cosmic radio noise, F2 component 3=25988

Absorption—contd

electromagnetic waves—contd

- cosmic noise, rel. to magnetic SSC 3=9135
- cosmic radio-noise, rel. to ionosphere F-region electron content 3=6985
- covalent crystals, electron transitions 3=15661
- crystals, plasmons, theory 3=2771
- cyclotron, in plasma 3=16940
- dispersion and absorpt., relation between 3=19001
- elastic wave generation, by pulsing in solids, and e.m. beam study 3=18889
- e.l.f. in isotropic ionosphere with exp. cond.-height profile 3=508
- ferrite sphere, ferromag. reson., v.h.f. power absorbed, temp. meas. 3=11106
- gases, resonant absorption of several oscillating fields nonlinear effects 3=2144
- h.f. radio, ionospheric, over equatorial, temperate and auroral regions 3=5870
- in homopolar crystals, by electron virtual excitation and annihilation 3=10589
- by ionized atmosphere, rel. to nuclear explosions in space 3=13727
- in ionized medium, theory review 3=5864
- ionosphere, anomalies 3=5866
- ionosphere, blackouts, polar, riometer obs. 3=5878
- ionosphere, D region, anomalous, winter, and temp. 3=25927
- ionosphere, D-region, rel. to cosmic rays 3=9083
- by ionosphere, damping theory 3=3488
- in ionosphere, decametric, from nuclear explosion 3=7721
- ionosphere, D-region rel. to electron densities 3=6983
- ionosphere, inversion of data for calc. ionosph. props. 3=16249
- ionosphere, not sharply bounded 3=9955
- ionosphere, 27.6 Mc/s, high latit., and geomag. storms and giant pulsations 3=13737
- ionosphere, variations, similar, at geomag. conjugate points 3=16237
- ionospheric, conjugate point relationship at high latitudes 3=13711
- ionospheric, at Hawaii and Johnston Island 3=5869
- ionospheric, at long distances 3=5863
- ionospheric, blackout, worldwide patterns 3=5875
- ionospheric blackouts at Terre Adélie in 1957-58 3=5873
- ionospheric D-and E- regions, short-waves 3=5880
- ionospheric, D-and E-regions, time varn. 3=5879
- ionospheric, during storm in Arctic 3=5874
- ionospheric, h.f. and v.h.f., polar cap and auroral 3=5876
- ionospheric, low-freq. sunrise effect 3=5882
- ionospheric, meas. meth. using satellite radio-waves 3=5867
- ionospheric, near auroral zone 3=5872
- ionospheric, polar-cap, May and July 1959, morphology and interpret. 3=5877
- ionospheric, 2 Mc/s, high-latitude 3=5871
- ionospheric, winter anomaly 3=5883
- in medium with spatial dispersion 3=4845
- plane-parallel layer, wave optics 3=9605
- plasma, cyclotron reson. absorption, line shape 3=2003
- plasma, electron behaviour meas. 3=9795
- plasma, microwave absorption 3=14577
- plasma, quasilinear approx. 3=24283
- plasma, negative, theory 3=4137
- plasma, quantum and classical 3=16941
- plasma, quantum, h.f., in mag. field 3=14580
- in plasma, temp.-diagram technique 3=405
- polar-cap, h.f. oblique-incidence circuit effects 3=14783
- polar-cap, 10 Nov. 1961 3=509
- and semiconductor carrier lifetime meas., high cond. 3=20296
- short-wave fadeouts in ionosphere 3=5868
- slot, 10-14 kMc/s 3=24474
- superconductors, anisotropy effects, near threshold freq. 3=3944
- in turbulent medium, without assuming small perturbations 3=12315

light

See also Atmospheric optics; Densitometry; Filters, optical; Optical constants; Optical films; Pleochroism; Transmission, light; Spectra

alkali halides, i.r., mechanism 3=17994

Absorption — contd

light — contd

- alkali halides, Ag ions, oscillator strength 3=10965
- alkali metal thin films 3=18385-90
- in alloys, dilute, i.r., theory 3=8589
- anils, thermochromy, time constants 3=20979
- anthracene, meas. and exciton model 3=2970
- aragonite minerals, i.r. 3=25189
- atoms, photoionization from outer subshells, model 3=708
- Bouguer's law, appl. to resonance radiation and negative absorption 3=9597
- cell, White, multiple pass 3=24022
- cloud layer, effect of multiple diffusion 3=3467
- by conduction electrons, in nonmetals, in elec. field 3=4967
- and crystal excitons 3=17692
- atomic. analytical curves rel. to line profiles 3=18465
- by crystal excitons, moments, temp. var., calc. 3=20461
- crystal films, i.r. longitud. optic freqn. 3=15663
- crystalline plates, principal vectors soln. 3=15649
- crystals, along circular optic axes 3=15648
- crystals, ellipsoids of refraction and absorption, limitations 3=15665
- crystals, in exciton transition region 3=15668
- crystals, impurities, near exciton bands 3=17993
- crystals, impurity bands, vibr. structure 3=8587
- crystals, i.r., allowing for three-phonon interaction 3=20460
- crystals, mag. absorbing optically-active 3=13148
- crystals, rel. to anharmonicity interact. with higher order elec. dipole moments 3=10926
- diamonds, i.r. and u.v. 3=18003
- diamonds, type IIb, direct lattice absorption 3=928
- dispersion and absorpt., relation between 3=19001
- elastic wave generation, by pulsing in solids, and light beam study 3=18889
- gases, resonant absorption of several oscillating fields, nonlinear effects 3=2144
- heterogeneous systems, photographic dye images 3=5539
- ice (sea), rel. to porosity and wavelength 3=13650
- infrared, current research papers 3=9652
- iodine crystals, under v. high press., optical gap 3=17812
- ionic crystals, small-polaron theory 3=13162
- ionic solids, relation of absorption to emission probabilities, theory 3=6666
- i.r. by water vapour in atmos. 3=11409
- i.r., deduction from refl. meas. 3=16789
- Intran-1 3=20480
- Lambert's law, appl. to resonance radiation and negative absorption 3=9597
- by metal films, plasma oscillations 3=12952
- metal films plasma resonance absorpt. 3=10634
- metal thin films 3=15666
- metal wires, thin, rel. to plasma props. 3=13159
- metallic thin films evap. on quartz substrate 3=6626
- metals, films, oxidation and wavelength effects 3=17991
- mirrors, metal-dielectric, semitransparent, u.v. 3=9576
- mists and fogs, 0.35-10 μ 3=1436
- molecular crystals, long wave theory 3=20428
- molecular crystals, rel. to saturation effect 3=20455
- molecule, radiation absorpt., general theory 3=17555
- molecules, diatomic, spectral coeffs. 3=2606
- negative coeff. in amplifiers and lasers, Bouguer's law 3=9597
- noble metals, monovalent, films, influence of substrate expansion 3=6649
- non-parallel radiation, medium with plane-parallel surfaces 3=5526
- optically active isotropic plate 3=16788
- organophosphors, absorpt. anisotropy 3=20492
- phosphors, microcrystalline grains, meas. 3=4980
- photographic deposits, Ag grains 3=21576
- photons by gases, cross-section meas. 3=9509
- plane-parallel layers, nonlinear theory 3=16787
- in plasma, non-uniform 3=5674
- plane-parallel plate, convergent beam 3=19002
- polymers, effect of chain length 3=10916
- powders, theory 3=10901
- quantized radiation field, density matrix eqns. 3=25085

Absorption — contd

light — contd

- quartz, far i.r., liquid He temps. 3=3006
- quartz, Ge-doped 3=20238
- resonance radiation, Bouguer's law 3=9597
- ruby, $A_2 \rightarrow {}^2F_1$ transition, identification of components 3=3015
- semiconductor or insulator, elec. field effects 3=13160
- semiconductors, by conduction electrons in strong electric field 3=20459
- by semiconductors, degenerate 3=20454
- semiconductors, degenerate, freq. depend. near edge, theory 3=20129
- semiconductors and insul. in uniform field 3=15664
- snow, rel. to porosity and wavelength 3=13650
- solids, cooperative 3=23058
- solids, edge, effect of defect fields 3=13161
- spectra in the sea-depths 3=9011
- spectral bands, along slant paths 3=14339
- spectroscopy, rel. to chem. reaction order 3=6908
- sum rules for total cross-sections 3=11798
- suspensions of large coloured particles, interaction with scatt. 3=9621
- thiocyanate complexes, i.r. 3=3012
- valency crystals, i.r., by imperfections, theory 3=10928
- water, distilled, sea, heavy 3=18626
- white coatings, i.r., diffuse reflection 3=16786
- AgAu, absorpt. edge change on plastic deformation 3=10962
- AgBr : Ni, bleaching processes 3=13187
- AgCl crystals, u.v. absorpt. 3=929
- Ag films, Im $1/\epsilon$ spectrum 3=10963
- Ag halides 3=12940
- AgI, under v. high press., optical gap 3=17812
- Ag wire, meas. down to 2000 Å diam. 3=13159
- Au layers, absorptance 3=11934
- Bi, i.r. magnetoabsorption, interband transitions 3=8592
- Bi, i.r., rel. to electric carriers 3=4970
- CO₂, far i.r., collision-induced 3=23932
- CO₂, total absorptance in i.r. 3=14216
- CS₂, liquid, i.r. 3=3021
- CaF₂, additively coloured, i.r. 3=20470
- CaF₂, i.r. behaviour 3=10939-40
- CaF₂ thin films, absorpt. edge, temp. depend. 3=3002
- CaO, films, 5.5-11.3 eV 3=20471
- CdTe, coeff. meas., temp. depend. 3=23067
- Co, films, oxidation and wavelength effects 3=17991
- Co²⁺ ions in organic solvents 3=10923
- in Cs, double-photon 3=6359
- CsI, far i.r., liquid He temps. 3=3006
- Cu, films, oxidation and wavelength effects 3=17991
- Cu, films, 4-20 μ , anomaly 3=17996
- Cu₂O films, and exciton formation 3=13170
- Fe, films, oxidation and wavelength effects 3=17991
- GaS, absorpt. edge 3=10946
- Ge, compensated heavily doped, meas. 3=2988
- Ge, doped, direct lattice absorption 3=928
- Ge, highly doped, i.r. meas. 3=15679
- Ge, by surface states 3=25251
- Ge thin films, u.v. 3=2995
- GaAs, and electron effective mass, Fermi energy 3=23070
- H⁺, bound-free absorption coeff. 3=2557
- HCl gas, i.r., up to 1200°K 3=16661
- H₂O vapour, total absorptance in near i.r. 3=23933
- Hg[Cd]Te-In₂[Ga₂]Te₃, solid solutions 3=11301
- Ho³⁺ in crystalline salts, u.v. absorpt. 3=3008
- InAs, at liquid H temp. 3=6339
- InSb, free carrier and interband, magneto-opt. oscill. 3=10917
- InSb, i.r., by free-carriers 3=23071
- K, internal photoelec. effect, meas. 3=17976
- KBr, with anionic impurities 3=25464
- KBr, strained, pure or Tl doped 3=18054
- KBr, structure vib., sp. ht. meas. 3=12926
- KCl, F = F' reaction and F' lifetime study 3=2840
- KCl, heavily γ -irrad., F- and M- band absorption 3=816
- KCl strained, pure or Tl doped 3=18054
- KCl : Ag, X-irrad., trapped holes and electrons 3=5044
- KCl:Co²⁺ and :Ni²⁺, meas. 3=10923
- KCl:Sr, Z₁-centres absorption, e.s.r. 3=25304

Absorption — contd**light — contd**

- KD₂PO₄ 3=17943
 KH₂PO₄, i.r. 3=20384
 KI strained, pure or TI doped 3=18054
 KMg(Ni)F₃, coincidence with fluorescence 3=19993
 LaB₆, and semicond. 3=20437
 Li, photoelectric K-absorption cross-section 3=704
 LiF, coloured, sharp absorpt. lines 3=814
 LiF, i.r., theory 3=15684
 LiF, rel. to colour centres 3=22836
 LiF, vacuum u.v., β -irradiated, effect of bleaching in
 Flight and immersion in water 3=13178
 MgO, i.r. theory 3=15684
 MgO particles, rel. to wavelength 3=924
 MoS₂, thin crystals 3=10957
 MoTe₂, absorpt. edge, bands, observation 3=25466
 NH, free radicals 3=8308
 NO, γ -bands at 2000°K, spectral coeffs. 3=2606
 NO₃⁻ ion in soln., u.v. 300 m μ band 3=1689
 N₂O, total absorptance near 4.5 μ 3=14217
 NaCl, coloured, with Cd, Na addns., u.v. absorpt. 3=813
 NaCl crystals, u.v. absorpt. 3=929
 NaCl:Co²⁺ and :Ni²⁺, meas. 3=10923
 NaCl:Pb, thermal treatment, X-irradn. effect 3=940
 Nd(NO₃)₃.6H₂O, far i.r., liquid He temps. 3=3006
 Ni, films, oxidation and wavelength effects 3=17991
 Ni²⁺ ions in organic solvents 3=10923
 O₂, solid, at 1550 cm⁻¹ 3=3010
 P, black, crystalline, absorption edge 3=17891
 n-PbS-p-PbO films, in Resistron charge-storage
 tubes, wavelength, temp. var. 3=25419
 S, rhombic, i.r. 3=3021
 Sb, i.r., rel. to electric carriers 3=4970
 Se thin films, u.v. 3=2995
 Se, under v. high press., optical gap 3=17812
 Si, doped, direct lattice absorption 3=928
 Si, impurities, lattice vibrations 3=10581
 Si, intrinsic absorption, heavy doping effect 3=15688
 Si oxide film, thermally oxidized, 9 μ , decrease on
 γ -irradiation 3=13189
 Si thin films, u.v. 3=2995
 SiO films, effect of evaporation rate 3=20486
 SnI₄, under v. high press., optical gap 3=17812
 SnO₂, rel. to crystal structure 3=2924
 Te, polycryst., i.r. meas. 3=13151
 Te thin films, u.v. 3=2995
 TiCl₃, wavelength depend. 3=3023
 WSe₂, absorpt. edge, bands, observation 3=25466
 ZnP₂, red and black forms 3=16072
 ZnS, evap., u.v. meas. 3=926

Abundance ratio.

See Elements, relative abundances; Isotopes,
 relative abundances.

Acceleration

See Dynamics; Kinematics

Acceleration measurement

- Hall effect spring system 3=21287
 linear air trough, modification 3=1646

Acids, inorganic

See individual compounds.

Acids, organic

See Organic compounds.

Acoustic analysis

- bagpipe sounds 3=23988
 field representation, optical 3=18908
 filters, bandpass, errors 3=227
 Gaussian-filter spectrum analyser 3=11870
 integrator for spectra 3=18937
 noise, random, short-duration 3=14285
 speech analysis—synthesis, using orthog.
 exponentially damped sinusoids 3=13947
 speech, instrument to record frequency spectrum
 intensities 3=1779
 speech, spectrographic pictures 3=21153
 speech, use in conversion into typed and translated form
 3=1551

Acoustic generators

See also Musical instruments.

- air jet, influence of baffle 3=16704

Acoustic generators — contd

- atmosphere, turbulence, noise theory. 3=25914
 balloon burst as impulsive source 3=14255
 booms from aircraft in manoeuvres 3=16693
 boundary layer turbulence 3=9553
 capillary systems containing Hg droplets and electrolyte,
 on appl. a.c. 3=18911
 centrifugal blowers, pure-tone prod. 3=23978
 choked axisymmetric jet 3=1767-8
 evaporation pressure in a radiation beam 3=19062
 fan wheels, noise level rel. to design 3=14287
 very high output, "vibrator Ampullaceus" 3=5493
 hypersound, by slow e.m. waves 3=18913
 jet noise, use as noise sources 3=14286
 jet of air, oscillation wavelength rel. to sound
 wavelength 3=1769
 magnetoacoustic and thermoacoustic, underwater 3=14256
 piezoelectric ceramics, meas., new standard 3=18942
 quartz, prod. of plane progressive wave in water 3=16705
 quartz-cavity resonator, 3 Gc/s, analysis and
 design 3=18941
 siren, for wide-band noise generation 3=9569
 siren, operating characteristics 3=21496
 surface waves in ocean, Knudsen spectra 3=16201
 in turbulence, boundary-layer 3=18914-15
 u.s. plane and polarized, by quartz transducer 3=18912
 u.s. standing waves prodn. 3=18793
 vibration control by resilient mounts 3=14231
 vortex whistle in air and water 3=18916

Acoustic impedance

- cylindrical resonance tubes, terminal, calc. 3=5498
 cylindrical waves, radiation impedance. 3=209
 ear, artificial, of C.N.E.T. 3=1553
 human ear, meas. 3=21156
 hydrophone meas. in a pipe 3=9554
 membranes and plates 3=23982
 point and line sources near reflectors 3=18917
 water, 3.2 Gc/s 3=18934
 He³, and zero sound, 0.09°K 3=19093
 He⁴, liquid, down to 0.04°K 3=19093

Acoustic radiators

See also Doppler effect.

- aerials, design 3=14314
 cylindrical, with specified directive characteristics 3=1771
 directivity index, 3-dimensional array of sources 3=14254
 earphones, circumaural, acoustics 3=226
 earphones, condenser, with multiple solid dielec.
 layers 3=1780
 gas-jet, shock, oblique 3=16703
 impedance of source near reflectors 3=18917
 infinite plate in water, excited at one point 3=23975
 linear array performance rel. to statistical phase
 fluctuations 3=5491
 loudspeakers for radiation monitors, saw-tooth pulse
 excitation 3=2169
 magnetostrictive vibrator apparatus, 500 W 3=229
 membranes and plates, radiation impedance, acoustic
 coupling 3=23982
 oscillating disks, mutual coupling 3=18921
 parametric array with semipermeable screen 3=11860
 piston in nonrigid baffle 3=7288
 piston, vib., equiv. Eulerian boundary conditions 3=5496
 pistons, circular, infinite array on rigid plane. 3=203
 pistons on nonrigid baffle, radiation
 impedance. 3=204
 plane source, radiation into circular ducts 3=9557
 radiation efficiencies of gypsum, concrete panels 3=7300
 spherical, approx. representation of point
 detonation 3=14248
 turbulence radiation 3=9570
 underwater sound projector, logarithmic-periodic 3=7297
 vibrating source on ribbon plate, acoustic field 3=21495

Acoustic receivers

See also Microphones.

- correlation meas., effect of noise cross-correl. 3=9556
 cross-correlation detector, output signal 3=7289
 cylindrical, with specified directive characteristics 3=1771
 hydrophone, for high pressures 3=228
 parametric array with semipermeable screen 3=11860
 spherical arrays, directivity 3=18922

Acoustic receivers — contd

- underwater detection, in presence of non-Gaussian noise. 3=207
- vibration control by resilient mounts 3=14231

Acoustic resonators

- absorption, slit, equivalent circuit analysis 3=18928
- cylindrical cavity, centrally vented, pressure-antisymmetric modes 3=7287
- cylindrical tubes, terminal independence, calc. 3=5498
- piston, cavity-loaded 3=225
- quartz-cavity, 3 and 10 Gc/s regions 3=18934
- resonance, effect of thermal motion 3=16706
- tube with short-closed side tube, gas filled, reson. frequency 3=18910
- tubes, linearity/non-linearity criterion 3=5490
- vibration control by resilient mounts 3=14231

Acoustic streaming

- theoretical, acoustic beam absorptn. 3=214

Acoustic transducers

- See also Acoustic generators; Acoustic receivers; Hearing aids; Microphones; Sound reproduction.
- BaTiO₃, sandwich form, electromech. impedance 3=9555
- cavitation limit, nearfield effects 3=23976
- ceramic piezoelec. spherical, prestressed electrodes 3=5504
- composite type, electromechanical coupling 3=7293
- earphones, condenser, with multiple solid dielec. layers 3=1780
- elastic vibr. prod. in disk by ferromag. resonance 3=23958
- electro-mechanical, resonance, very-high output 3=5493
- farfield characteristics 3=14257
- garnets, nonmagnetic, microwave elastic props. 3=25601
- hydrophone, in a pipe, impedance seen 3=9554
- hydrophone, piezoelec., sensitivity meas. 3=7292
- line-and-cone, for underwater use. 3=206
- mechanical bias, origin of term 3=23977
- mechanical props. tester for flabby materials 3=3783
- mutual coupling in arrays 3=18921
- narrow-beamwidth, design 3=18919
- piezoelectric, electromech. coupling coeff. meas. 3=5494
- pressure resolution in turbulence 3=9484
- sonar projector arrays, erratic velocity distrib. 3=219
- ultrasonic, CdS with Cu diffused layer 3=9566
- u.s. delay lines for d.c. pulse transmission. 3=205
- underwater arrays, piston resonators 3=225
- underwater, far-field characteristics determ. 3=1778
- vibration control by resilient mounts 3=14231
- water-borne, calibration in 5-250 kc/s 3=7291

Acoustic wave propagation

- See also Absorption, acoustic waves; Dispersion, acoustic; Doppler effect; Helium, liquid, sound propagation; Shock waves; Velocity, acoustic waves.
- acoustic line, surface burnishing rel. to surface attenuation 3=21498
- amplification in semicond. and metals 3=8354
- amplitude transformers for high magnification 3=23980
- bone conduction, review and work of Békésy 3=3668
- deep-water, Lloyd-mirror effect. 3=213
- effects of incidence on burning solid 3=280
- Eulerian boundary conditions, vibrating piston radiation 3=5496
- in Fermi system with non-zero ang. mom. 3=5383
- in ferroelectrics, interaction with e.m. waves 3=2949
- finite-amplitude waves in relaxing medium 3=14258
- in flow channels, high vel. 3=18920
- in gas of rigid spheres 3=5466
- HCl, in critical-temp. region 3=18858
- induct, rectangular, containing porous material 3=14260
- ionic in gas discharge tubes, obs. 3=7457
- liquid, gravitational flexure waves 3=1422
- medium with strong refr. index fluctuation 3=21972
- metals, in mag. field, oscillations 3=4129
- metals, velocity change by mag. field 3=15432
- parametric effect 3=7290
- from plane source into circular ducts 3=9557

Acoustic wave propagation — contd

- piezoelectric crystals, sound amplification limitation 3=17650
- in plasma, compressional waves 3=7548
- plasma, electroacoustic, quasisteady approach 3=24320
- in plasma, eqns. derived from e.m. wave propag. 3=7549
- plasma, ion waves, propag. and damping 3=4128
- plasma, ionic sound waves meas. 3=5658
- plasma, magnetoacoustic reson., heating 3=7613
- α -quartz 3=20087
- Quincke tube, theory 3=11863
- radiation from piston in nonrigid baffle 3=7288
- resonance, effect of thermal motion 3=16706
- rooms, growth and decay transients meas. 3=3857
- semiconductors, amplification by cond. electrons, mag. field depend. 3=25194
- semiconductors, amplification, by electron-phonon interaction 3=20092
- semiconductors, longitudinal space-charge waves 3=22920
- shallow water tank, theory and expt. 3=16620
- slot in rectangular tube, end correction 3=21497
- small bodies moving in gases, emission theory 3=1719
- solids, resonant amplification by cond. electrons 3=20093
- solids, second sound, macroscopic theory 3=25193
- sound radiation in terms of pressure independent of sound speed 3=18924
- steel wool 3=11862
- transformation at conductor boundary, in magnetic field. 3=208
- transmission line, resonant behaviour 3=14238
- underwater characteristics in Arctic Ocean 3=13652-3
- water, reservoir, effect of surface oscillations on phase 3=16709
- water, sound cavitation, U salts effects 3=18794
- ultrasonic
 - associated liquids, mechanical and dielec. relaxation 3=21390
 - crystals, anharmonic, diffr. of light 3=25442
 - crystals, distortion, and lattice anharmonicity 3=17654
 - crystals, velocity changes rel. to deformation and dislocation pinning 3=23325
 - delay line, crystal, using ray deviation from wave normal 3=14264
 - delay lines, mechanical input admittance 3=18923
 - delay lines, polygonal, design. 3=210
 - limestone, elastic props. invest., in situ 3=9003
 - liquids, birefringence prod., theory 3=1687
 - liquids, det. of degree of association 3=1684
 - into metal single crystals by coupling cements 3=18936
 - metals, long. and transverse, ~ 1 Mc/s pulse frequency 3=18891
 - microwave (1-24 Gc/s) ultrasonics, in solids, review 3=6470
 - near resonant absorption, signal velocity meas. by u.s. paramag. resonance 3=6759
 - non-linear bodies, by interaction with elastic waves 3=25191
 - plasma, magnetostatic waves 3=14612
 - plasma 3=4113
 - polysiloxanes, linear, u.s. relaxation study at 30-270 Mc/s 3=11793
 - in quartz bars, hypersound at 10^{10} c/s 3=5492
 - semiconductors, extrinsic, amplification 3=12921
 - semi-metals, amplif. of ultrasound in elec. and mag. fields 3=15433
 - in semi-metals in elec. or mag. fields, amplification, theory 3=5495
 - solids, microwave interaction with electron spins 3=8351
 - solids, plasma, amplification 3=22633
 - solids, propagation, deviations from Hook's law 3=15434
 - in solids, review 3=10594
 - spiral wires, wavelength \gg transverse dimensions, velo. 3=21499
 - strip delay lines, thickness tapering 3=14259
 - visualization of u.s. wave 3=14366
 - in waveguides, pressure profiles 3=14263
 - Ag, 62 Mc/s 3=10592
 - Al, 62 Mc/s 3=10592
 - Bi, liquid 3=9457

Acoustic wave propagation — contd**ultrasonic — contd**

- Ga, 62 Mc/s 3=10592
- Ge, 62 Mc/s 3=10592
- H₂, rotational-relax. freq., rel. to temp. 3=14212
- Hg, liquid 3=9457
- InSb, 62 Mc/s 3=10592
- K formate, acetate and propionate solns. 3=14162
- Na formate, acetate and propionate solns. 3=14162
- Ni—Zn ferrite, 5 Mc/s 3=17652
- Zn acetate aq., rel. to temp. 3=3803

Acoustic waves

- See also Diffraction; Interference, etc.; Elastic waves; Shock waves; Ultrasonics.
- Aeolian tones generation, associated sound field 3=1770
- amplification, crossed elec., mag. fields, giant quantum osc. 3=20094
- atmospheric, produced by nuclear explosion "outside" atmosphere 3=9060
- aurora, excitation by electron streams 3=18528
- energy, theory 3=16707
- generation, in pinch effect, InSb, InAs, at sufficiently high currents 3=6597
- ionosphere, excitation by electron streams 3=18528
- paramagnetic resonance in S-state ions 3=2725
- perovskite ferroelectrics, excitation of anomalous layers 3=22993
- plane progressive, prod. in water by quartz transducer 3=16705
- Rayleigh, ultrasonic 3=18906
- sonar eqn. 3=9551
- underwater generation by H₂—O₂ explosions 3=9552
- u.s. wave velocity, high temps 3=18936
- Ar, radiation pressure, Broullion's relationship 3=16657
- GaAs, excitation, nonlinear 4=17651

effects

- See also Chemical effects of radiations, acoustic waves.
- alloys, precipitation hardening, u.s. effects 3=16109
- coloration accel. of starch films in iodine 3=18793
- combustion, liquid fuel 3=16715
- damping of vibrating structures 3=16673
- diffraction, light, by damped u.s. 3=19019
- effect of electron energy spectrum of crystal 3=15459
- flow pattern from porous wall 3=23833
- glass breakage by sonic booms 3=16692
- heat transfer from cylinder to air in crossflow 3=21582
- on heat transfer 3=11973
- ionized gases, e.m.f., a.c., apparatus 3=19181
- luminescence, liquids, by cavitation, u.s. 3=18819
- n.m.r. stimulation, by u.s., review 3=20665
- organic liquid crystals, domain structure, rel. to u.s. waves 3=18798
- precipitation, ZnO, aerosols, l.f., spiral 3=18462
- rocket motors, acoustic instability 3=7287
- sphere in sound field, force on, motion of 3=18909
- u.s. atomization of liquid films 3=23850
- u.s., diffraction of light 3=19020
- u.s. optical gratings, interference patterns 3=9610
- water, cavitation in u.s. fields 3=18793
- water, deionized, conductivity electrical, increase by ultrasonics 3=18830
- 100 Mc/s in water, on angular width of diffracted light 3=11938
- DNA degradation by noncavitating ultrasound 3=20036
- KI, decomposition by u.s. waves 3=16162
- Sn¹¹⁰, splitting of Mössbauer line by u.s. vibrations 3=15426
- Zn, single-crystal growth 3=6828
- ZnO, aerosols, precipitation, l.f., spiral 3=18462

Acoustical laboratories

- anechoic chamber with fibre glass wedge absorbers 3=16716
- underwater sound research, 1915-17 3=14277
- wedges, absorbing, phenopolyurethane 3=16717

Acoustical measurement

- See also Interferometry, acoustic waves; and under separate subjects e.g. Intensity measurement, acoustics.
- absorption, reverb. chamber techniques 3=14279
- audiometer, principles and history 3=16452
- automobile noise, instruments 3=14292

Acoustical measurement — contd

- coal mines, hammer blow signals, range 3=14284
- correlation detector, signal-plus-noise inputs 3=18935
- correlation, rooms, simple 3=18947
- far-field characteristics of underwater sound transducers 3=1778
- hydrophone, piezoelec., sensitivity meas. 3=7292
- impact noise, tapping-machine standard 3=23989
- impedance, absorpt., with impedance tube 3=18943
- loudness, objective, calc., Zwicker's method 3=16718
- microphone sensitivity 3=9568
- pressure chamber, for impedances of small bodies 3=7295
- sound distrib. in reverberation chamber 3=1776
- thermocouples, miniature, u.h.f. acoustic detectors 3=1862
- transducer platform for underwater meas. 3=18944
- ultrasonic, coupling of transducer to specimen 3=5503
- u.s. fields, BaTiO₃, microprobe 3=1777
- wavelength in gases in tube 3=5502
- wedges, absorbing, phenopolyurethane 3=16717

Acoustics

- See also Architectural acoustics; Atmospheric acoustics; Hearing; Noise, acoustic; Resonators, acoustic; Sound reproduction; Speech; Ultrasonics; Vibrations.
- acoustic field, interact, between two spheres 3=1766
- amplitude transformers for high magnification 3=23980
- beats, interference pattern, demonstration expts. 3=23985
- conference, fourth international, Copenhagen (1962) 3=21494
- conference, Kiev, Nov. 1961 3=1764
- diffuse sound field, space and frequency irregularities 3=7286
- drying, in standing sound wave. 3=218
- field representation, optical 3=18908
- flabby material, mech. props. tester 3=3783
- kinetic theory, appl. 3=9499
- power, energy, etc., spectrum levels and spectral densities 3=18907
- power spectra, autocorrel. functions, meas. with realizable filters 3=1765
- radiation reaction, motion of solids in inhomog. gas 3=23974
- sonic boom (supersonic bang) from aircraft, review. 3=221
- teaching, methods of attracting physics students 3=9319
- teaching, school installations 3=13994
- underwater sound research 1915-17 3=14277

musical

- See also Musical instruments.
- absolute pitch, origin 3=18678
- clarinet 3=16713
- loudness levels of musical sounds, calc. 3=1558
- musical—acoustic common vocab. 3=14301
- philosophical scales since Pythagoras 3=14275
- role of acoustics in art 3=16712

Acoustoelectric effects

- amplification, acoustic, crossed elec., mag. fields, giant quantum osc. 3=29904
- metals, magnetic-field dependence 3=10591
- plasma, electroacoustic waves, quasisteady approach 3=24320
- polar lattice, optical mode travelling wave interact. with charge carriers 3=22887
- semiconductors, piezoelectric, rel. to frequency 3=10755
- Bi, amplification, 15 Mc/s, steady mag., pulsed elec. fields 3=20095
- CdS, strong, due to piezoelectric coupling 3=8567
- Si, elastic constant 3=18162

Actinides

- ions Pa³⁺—Cf³⁺, Hartree—Fock calc. 3=12767
- review article 3=4284

Actinide compounds

- No entries this year

Actinium

- No entries this year

Actinium compounds

- No entries this year

Activation analysis

- See Chemical analysis, by nuclear reactions.

Adhesion

- adhesives, review of action 3=124
- bonds, between sheet materials, testing, use of heat conduction 3=13984
- meas., low-strength, lap-joints 3=13979
- metal films on crystal faces 3=23504
- sputtering, greater than evaporation, mechanism 3=23505

Adsorbed layers

- aromatic hydrocarbons, effect of adsorption on Raman molec. spectra 3=8932
- elastic props., rel. to surface H bonds 3=6897
- fluorescein, spectra, by quantum chemistry 3=2647
- oriented monolayers on Hg electrodes 3=1380
- spectra, i.r. and Raman, rel. to model 3=5152
- stearic acid on stressed metal surfaces, birefringence 3=4962
- water, on Si gel, freezing, phase transformations, n.m.r. obs., to -100°C 3=19069
- weight rel. to i.r. spectrum 3=21285
- Al_2O_3 , fluorescein-activated, luminescence 3=3036
- Ba, on W, effect on work function 3=14615
- Cl on W, kinetics 3=11323
- He^3 , n.m.r., 2° – 4.2°K , extension 3=19091
- O, on metals, effect on elec. cond. and superconductivity 3=16872

Adsorption

- See also Chemical analysis, adsorption; Chromatography; Films; Heat of adsorption; Sorption.
- adsorption—extension phenomena, thermodynamics 3=20937
- adsorption—flocculation of polymer on colloid 3=6891
- apparatus, for study of O_2 adsorption in W 3=6887
- atomic collisions with crystal surface, impurity effects 3=25769
- atom-wall collisions, study by optical pumping 3=17537
- batch, from soln., eqns. deriv. 3=6895
- benzene, on characterized silicas 3=1382
- clay, water ads. during moisture expansion 3=6878
- desorption energy spectra, thermal resolution 3=3368
- diffusion, self, kinetics and thermodynamics 3=9376
- discharge chamber walls, ads. of H_2 3=7451
- dye mols. by cellophane foil 3=20492
- electrochem. study 3=13571
- electrochemical reactions, use of Gibbs adsorption eqn. 3=5168
- ethanol on Al_2O_3 surfaces, i.r. spectral study 3=3362
- field desorption of N and CO, corrosion of W and Ir 3=18396
- film formation theory, cryolite, CaF_2 , ZnS 3=13560
- films, solid, rel. to irradiation 3=6896
- flow of adsorbable gases and vapours in microporous medium 3=3823-4
- gases on metal films, surface potential change, meas. by static capacitor 3=9824
- gases on solids, lattice vacancy theory 3=3363
- at grain boundaries in solids 3=1383
- graphite, ads. of A, rel. to heat transfer 3=3907
- graphite, ads. of CO and water vapour 3=13569
- graphite, ads. of monatomic mols. thermodynamics 3=13572
- graphite, ads. of Xe, 2nd and 3rd virial coeff. 3=5150
- graphite adsorption of benzene, thermodynamic functions, calc. 3=18398
- heterogeneous and homog. surfaces, multilayer region 3=6888
- heterogeneous surface, homologous gas series 3=20935
- heterogeneous surface rates, characterization 3=20936
- heterogeneous surfaces, distrib. density functions 3=6886
- hydrocarbons, by metal films, decomposition 3=20939
- ions, suspensions, colloidal, lamellar 3=11364
- isotope separation of diatomic mols., theory 3=22513
- macromolecule, flexible, at plane surface 3=6892
- macromolecules, flexible, model 3=6893
- metal-electrolyte surface, neutral substance 3=6889
- metals, films, of electropositive atoms, effect on resistance and work function 3=13040
- methanol on Al_2O_3 surfaces, i.r. spectral study 3=3362
- monolayer, on square lattice, statist. mech. 3=3367
- monolayer, work function change 3=24328
- monolayers as single crystal surfaces, electron diffraction study 3=1379
- organic molecules, mutual attraction, potential effect 3=20938

Adsorption — contd

- on oxides, rel. to quad. moments, polarizabilities of various gases 3=3364
- polymer molecules, theory 3=15405
- pores, transport of adsorbed gases 3=3370
- in porous systems 3=20922
- quartz, ads. N atoms, surface recombination 3=5151
- radiolabelled cpds., meas. technique 3=8931
- semiconductors, chemisorption rate laws 3=1390
- solid—fluid interfaces, rate meas. 3=1672
- stearic acid, by mica, Fe, Cu and Au 3=8931
- steel, stainless, high-vacuum, gases, pulsed 3=16147
- and surface energy 3=23517-18
- surface heterogeneity, averaging approach 3=8929
- three-phase systems, contact angles 3=23519
- transition metals, field electron micr. study 3=3369
- in vacuum, partial and ultra, and desorption 3=18862
- vapours, two-phase flow, theory 3=25779
- water in $\text{AgI-KI-H}_2\text{O}$ 3=23522
- water on Ge, effect on fast states 3=20138
- water, on n-type Ge powder 3=6890
- water vapour, on insoluble metal halides 3=1381
- Ag, desorption energy from Mo and Ni 3=23521
- Ag on AgCl, energy 3=16842
- AgBr precipitates, of H^+ and OH^- ions from soln. 3=5165
- Ag_2O , ads. of cations, anions, in dilute solns. 3=13608
- Ar on graphitized carbon black 3=11324
- Ar, on hexagonal BN, multilayers 3=6894
- Ar, on water, n-hexane, n-octane, methanol 3=18795
- Au on Mo surface, 2×10^{-8} torr 3=5149
- Ba^+ , desorption from Re 3=8930
- Ba, field desorption from W 3=3360
- CaCO_3 (calcite) and electrode potential 3=8968
- CO on Ba, ultra high vacua 3=5474
- CO on chromia-alumina and Al, i.r. spectra 3=3359
- CO, on NiO, depletive 3=25781
- CO on Pt, mechanisms, electrochem. study 3=13571
- CO on Ta, field emission 3=14623
- CO_2 in "Aerosil" silica 3=18399
- CO_2 on chromia-alumina and Al, i.r. spectra 3=3359
- Cr ions, by exchange of ions, e.p.r. spectrum 3=8707
- Cs^+ , desorption from Re 3=8930
- Cs, field desorption from W 3=3361
- Cu, ads. of CO 3=11322
- Ge, of polar liquid mols., in crystal defect recomb. 3=22709
- Ge, on W, field emission study 3=8928
- GeO_2 , ads. of cations, anions, in dilute solns. 3=13608
- H on Ge films 3=3397
- H, by MgO, below 20°K , endothermic conversion of para to adsorbed equilibrium 3=20994
- H on Si, i.r. internal reflection study 3=18397
- H and Xe, on W, rel. to surface features 3=3369
- H_2 , on NiO, depletive 3=25781
- He in ionization gauge 3=16669
- at Hg—soln. interfaces 3=1380
- HgO, ads. of cations, anions, in dilute solns. 3=13608
- I, diffuse reflection spectra 3=13574
- I on graphite, meas. 3=20940
- I^{131} , use for meas. surface roughness of metals 3=13556
- KCl, on W and Ta, accommodation coeff. 3=5632
- Kr, for Brunauer—Emmett—Teller surface area meas. 3=5145
- Kr, on NaBr, statist. mech. study 3=3367
- Mo films, adsorption of CO and N, 10^{-6} – 10^{-8} mm, -195 – $+22^{\circ}\text{C}$ 3=16146
- N_2 in mass spectrometers, ionization by charge transfer 3=24212
- N_2 , isotherms meas., rapid flow method 3=11325
- N_2 by Ti films 3=23520
- N_2 , on water and n-hexane, 1=120 atm 3=18795
- Ne, A, Kr, Xe, H_2 , D_2 , CH_4 , CD_4 on carbon black 3=1377
- Ni, films, of Ba, effect on resistance and work function 3=13040
- Ni oxide, of O_2 , crystal field effects 3=13573
- O, on Ge, kinetics and mechanism 3=3365
- O and H on Ni (110) face, electron diffraction study 3=1378

Adsorption — contd

- O, on Mb, effect on vacuum ionization gauge meas. 3=21462
 O₂, in NiO, effects of neutron irradi. 3=13567
 O₂, on W 3=6887
 OH, by SiO₂, spectrum and heat vars. 3=8922
 SiO₂, surface elec. conductivity 3=25318
 T₂, on charcoal, ortho—para conversion 3=12789
 ThO₂, ads. of SO₄²⁻ ions, in dilute solns. 3=13608
 W, ads. of BaO, two-phase type 3=23541
 W, adsorption of BaO, from work function 3=19297
 W, adsorption of Ba and CO 3=18394
 W, films, of Cs, effect on resistance and work function 3=13040
 W, of gases, field emission microscope study 3=13568
 W surface, rel. to electron bombardment 3=18395

Aerials

See Electromagnetic waves, radiators.

Aerodynamics

- See also Flow, gases; Jets; Shock waves; Supersonic flow; Turbulence.
 airflow on windward side of ridge 3=9028
 centrifugal blower, acoustic spectrum 3=23978
 delta wing, supersonic flow past 3=162
 discontinuous gasdynamic eqn., soln. 3=23918
 He-tracing of flow patterns 3=14198
 magnetohydrodynamic finite amplitude waves 3=5828
 meteorites, transitional drag 3=13776
 rarefied gas dynamics, dispersion relations 3=7237
 rarefied gases, conference 3=11813
 small bodies at sub- and supersonic velocities in gases 3=1719
 sonic boom (supersonic bang) from aircraft, review. 3=221
 thin filament trailing in rarefied current of gas 3=5458
 transition reversal rel. to Tollmien—Schlichting instab. 3=9414
 transonic gas flow, plane, with singularities on sonic line 3=161
 transonic pressure fluctuations 3=23923

Aerosols

See also Foams.

- atmosphere, SO₄²⁻ at 20 km, particle size. 3=25871
 atmospheric, attachment of radioactive ions 3=9056
 atmospheric, Rn daughters. 3=25910
 behaviour in plastic chamber, electrostatic effects 3=8986
 cigarette smoke, optical scatt. and polariz. data 3=19024
 concentration sampling, continuous 3=21008
 disperse systems, ionization equilibrium 3=21696
 dust, airborne, surface area, light and electron microscope 3=18461
 dust in gas, thermionic electron emission and absorption 3=14528
 electric precipitation, dust space charge 3=24202
 flow, solid charge, spectrum, meas. 3=16184
 granularity meas. by light scatt. 3=21009
 metals, radioactive coagulation and scavenging 3=8985
 natural, radioactivity distrib. meas. 3=13691
 number concn., particle size analysis 3=3415
 optical studies, cloud chamber design 3=9584
 preparation for electron microscope invest. 3=13624
 radioactive, separation for small particle size 3=1401
 scattering, e.m. waves 3=19447
 shock waves, periodic, coagulation, oil mist 3=23555
 size distrib. from diffusion decay meas. 3=13625
 size distribution, by diffusion method 3=18463
 thermal flow 3=7228
 thermal force, from slip-flow continuum analysis 3=6935
 thermophoresis in capillaries, calc. 3=5173
 thermophoresis of large solid particles, theory 3=7230
 AgI, crit. temp. for phase changes 3=1402
 CdI₂, crit. temp. for phase changes 3=1402
 CuBr, crit. temp. for phase changes 3=1402
 NaCl, highly-dispersed, prodn., props. 3=8983
 NaCl, spherical particles 3=13626
 NaI, crit. temp. for phase changes 3=1402
 NH₄Cl, optical scatt. and polariz. data 3=19024
 PbCl₂, crit. temp. for phase changes 3=1402
 PbF₂, crit. temp. for phase changes 3=1402
 PbI₂, crit. temp. for phase changes 3=1402

Aerosols — contd

- PbI₂, ice-forming props., cloud seeding 3=8987
 ZnO, precipitation, by l.f. spiral acoustic field 3=18462

Air

See also Atmosphere.

- arc, d.c., rel. to pressure 3=16922
 arc, free-burning, voltage gradient 3=4072
 air-propane (4.16%), flames, spherical, formation 3=5550
 betatron, electron loss by scatt. 3=459
 breakdown, between plane electrodes, rel. to press. 3=4901
 breakdown, electrodeless discharge, in cross fields 3=371
 breakdown, microwave, meas. 3=5648
 breakdown, microwave, meas. 3=14560
 breakdown time-lag in crossed elec. and mag. flds. 3=5646
 corona discharge, rel. to Ar. CO₂. N₂ discharges 3=4046
 corona, positive burst pulse, formation, theory 3=372
 currents, around bodies, electrostatic charging 3=21688
 damp, breakdown potential, in uniform field 3=19227
 decomposition in He, Ne, plant 3=16472
 diffusion of H₂O, teaching meas. 3=21425
 dust sampler, drum-pump, continuous 3=8982
 elec. breakdown, high-voltage impulse in rod—plane gaps 3=4097
 elec. breakdown, u.h.f., time-lags 3=7491
 elec. discharge current, temporal growth 3=7460
 elec. discharge, shock waves, magnetically driven 3=7278
 electrodeless discharge at l.p., mechanism 3=1941
 electron avalanche pulses, pd = 100 to 2200 mm Hg 3=4085
 electron conductivity after weak ioniz. 3=3839
 electron irradi., free electron loss 3=14598
 flow, around streamlined plate, heat transfer 3=19033
 flow meas., smooth approach nozzle 3=7227
 flow, rarified, through porous materials, from free mol. to viscous flow 3=9483
 glow discharges, electron emission rel. to photons 3=7632
 ground level, N₂O, CH₄, CO abundances 3=13664
 heat-transfer, ionization effects 3=18853
 heat transfer, supersonic flow, circular pipe 3=14193
 heat transfer to, in turbulent flow round plate 3=19036
 ionization ahead of cylindrical shock waves 3=1759
 ionization and attachment coeffs., 100-300 mm Hg 3=4017
 ionization behind shock waves, theory 3=12074
 ionization growth at high pressures 3=24215
 ionization, by ruby laser 3=19170
 ionization by shock waves 3=7431
 ionization spatial growth, high-pres. 3=7428
 jet, acoustic radiation, influence of baffle 3=16704
 jet, turbulence energy spectra at high Reynolds number 3=5454
 plasma, thermodyn. equil. at high temps. 3=4118
 plasma, thermodynamic equil. at (2-10) × 10⁴ °K 3=24275
 plasma, thermodynamic parameters calc. 3=21818
 pollution, Japanese research 3=11391
 radiant emission from high-temp. equil. air 3=1732
 saturated with water vapour, dynamic contact angle with water between parallel plates 3=1672
 shock-heated, NO band emission near 1 μ 3=3836
 sound absorption, rel. to architectural acoustics 3=14302
 sound absorpt. rel. to humidity, 2000-12500 c/s 3=7241
 sound wavelength meas. in tube 3=5502
 spark discharges, intense light flashes, energy-time relation 3=21742
 spectra, emission, excited by protons and H atoms 3=15338
 stopping cross-section for 40-250 keV protons 3=22133
 Townsend discharge, photon absorption 3=4029
 triton range, 0.2-2.7 MeV 3=10180
 turbulent flow in pipes, local heat transfer coeffs. 3=9489
 turbulent flow, longitudinal space—time correlation 3=18839
 velocity of sound 3=5497
 viscosity, mean free path, teaching meas. 3=21425

Airglow

See also Atmospheric spectra; Aurora; Sky brightness; Twilight; Zodiacal light.

- day emission, atomic O lines obs. 3=1467
 day, 3000-9000 Å 3=18552

Airglow — contd

- day and twilight, O₂, (0,0) band obs. at 1.27 μ 3=18553
 effects of high altitude nuclear explosion 3=13696
 effects of vibr. excitation of molecules 3=13786
 explosion, nuclear, high-altitude, effects, 3914,
 6300A 3=13778
 fluctuations, rapid, search for 3=25932
 at high latitude, 6300 and 5577 A lines 3=5223
 ionospheric drift theory 3=21066
 Lyman- α , rel. to geocoma hypothesis 3=13779
 nightglow, brightness, effect of light scatt. 3=16280
 nightglow, fluctuations, Oct. 28-29, 1961, really due
 to aurora 3=13802
 nightglow, observations from manned spacecraft 3=11445
 nightglow, rapid-scanning photometer 3=9100
 nightglow, rocket rel. to satellite data 3=18556
 nightglow, separation from extra terrestrial sky
 brightness 3=16279
 nightglow, u.v., due to H, reson. scatt. by 3=11481
 nightglow, 3700-4650 A spectrum 3=6991
 nightglow, 5577 A, over N. America rel. to aurora 3=9118
 nightglow 5577(O I), Maruyama 3=11446
 nightglow, G2 stars?, criticisms refuted 3=18557
 nightglow, H α emission, origin 3=6992
 nightglow, N₂⁺ radiation, lightning enhanced 3=13784
 nightglow, O₂ band excitation 3=9103
 nightglow, O red line, intensity variation 3=1468
 nightglow, OH bands, transition probabilities 3=23628
 nightglow, OH and Na emissions, correlation 3=3511
 nightglow, OH, night-time variations 3=9101
 noctilucent clouds, Alaska 3=9095
 photometer, photoelectric, all sky 3=18547
 sun, radiation, particle, fluorescence detect. possibility,
 O⁺, N₂⁺ 3=25931
 twilight glow, Na D-line spectrum 3=9099
 twilight, 1.58 μ ¹ Δ _g - ³ Σ _g⁻ band, theory 3=25933
 N atom concn. det. from NO spectra 3=3508
 Na, 30-31 Jan. 1960 3=9096
 O, green ray, max. latitude 3=25930
 OI 30-31 Jan. 1960 3=9096
 O I 5577 nightglow 3=9102

Algebra

- isobaric spin algebra 3=11667
 Kemmer, and Foldy-Wouthuysen transformations,
 spins 0 and 1 3=14859
 Lie, representation, new concept 3=21194
 Lie, simple, partition function 3=11665
 Lie, soln. of linear differential eqns. 3=11664
 operator algebra for parafermi oscillators 3=23788
 restricted Poincare group, classical representa-
 tion 3=21197

Alignment

- angular, optical systems, by elastic deform., to
 0.01" 3=21523
 interferometer, light 3=16791
 line straightness, using spherical aberr. 3=16566
 precise, heavy instruments, using Teflon-coated
 steel 3=9393

Alkali metals

- See also the individual metals.
 absorption spectrum perturbations, caused by
 absorbed H, 400°-500°C 3=5443
 ammonia solns., heat conduction 3=14149
 atom reactions with methyl iodide 3=5160
 atoms, electric dipole polarizabilities meas. 3=6357
 diamagnetism of cond. electrons 3=8638
 electrical resist., temp. depend., theory 3=17815
 energy gap, nonlocal correl. effect 3=20137
 in Fe oxide catalysts, mass-spectrometric study 3=21891
 Fermi surfaces, nearly-free electron model 3=6490
 films, absorption light, selective photoelectric
 effect 3=20466
 in flames, detection and spectroscopic abundance 3=8990
 glow-discharge, moving striations, absence 3=4164
 liquid, heat capacities 3=23870
 liquid, temp. depend. of resistivity 3=18828
 microscopy, u.v. transmission 3=23523
 molecules, moments, rotational mag., by molecular
 beam 3=19974
 nuclear acoustic resonance absorption 3=20088

Alkali metals — contd

- ion mobilities, in own vapour, calc. 3=14526
 single particle processes, electron correl. 3=12947
 solution in molten alkali halide, conductivity,
 electrical 3=18829
 for temperature meas., flame spectral sources, from
 partial pressure 3=19051
 for temperature meas., flames, using resonance spectral
 lines 3=16829
 thin films, structure, elec., and optical props. 3=18385-92
- Alkali metal compounds**
 See also the compounds of the individual metals.
 alloys, impurity electronic structure 3=22757
 antimonides, films, 200 A thick, elec. resistance rel.
 to formation time 3=25351
 azides, photocond. and photoelec. emission 3=25415
 binary mixed crystals of KCl, RbCl, KBr, colour centres,
 F-band, shifts 3=20245
 borate glasses, B n.m.r., var. composition 3=18147
 fluorides, bonding of Fe-group ions 3=15407
 fluorides, bonding of Fe-group ions in crystal 3=20043
 fluorides, U-activ., luminescence centres 3=25478
 halide crystals, containing, Sm²⁺, spectra, absorpt., 300,
 77°K, luminescence 3=23079
 halide crystals, electrolysis 3=20380
 halide crystals, lattice distortion around impurity
 ions 3=22756
 halide crystals, U-centres, vib. spectra 3=20247
 halide crystals, yield stress rel. to γ -irradiation 3=22649
 halide, molten, containing alkali metal, conductivity,
 electrical 3=18829
 halide phosphors, activator distrib. 3=947
 halide phosphors, Ag activated, quenching 3=944
 halide phosphors, crystal structure and
 luminescence 3=23100
 halide phosphors, crystals and solutions, activator trapping
 centres, absorption and emission 3=20504
 halide phosphors, long wavelength luminescence
 bands 3=943
 halide phosphors, Sb-activated, luminescence 3=948
 halides, A-centres 3=22838
 halides, α and γ bands, exciton model 3=20467
 halides, α -centres 3=22837
 halides, anisotropy of spin-lattice relaxation
 time 3=25584
 halides and azides, crystallite growth on cleavage planes,
 rel. to irradiation 3=20254
 halides, bicrystals growth method 3=6824
 halides, Born repulsive potential 3=22825
 halides, Born-Meyer potential function 3=17628
 halides, Cauchy relns., failure theory 3=8750
 halides, charge of dislocations, meas. 3=22777
 halides, colouration mechanism at low-temp. 3=812
 halides, compressibility, shock, high press. 3=18179
 halides crystal cohesive energies, n.t.p., calc. 3=22620
 halides, crystal cohesive energy per cell 3=22621
 halides, crystal decomposition rel. to electron
 irradi. 3=17808
 halides, crystal growth, by floating zones 3=6825
 halides, crystals, surface energy, (100) faces,
 calc. 3=20073
 halides, defects, rel. to X-irradiation 3=20185
 halides, diffusion of inert gases, prod. by n
 irradi. 3=15508
 halides, distortion at surface, and within first
 5 layers 3=25768
 halides, divalent impurity aggregation, rel. to cation
 vacancies 3=22760
 halides, doped, scattering centres 3=17779
 halides, elastic consts. temp. var., high temps.,
 calc. 3=20687
 halides, exciton structure calc. 3=8406
 halides, F-centres, bleaching, low temp. 3=22843
 halides, F-centres, thermal stability 3=4890
 halides, hardening, rel. to point defects,
 20.5°-300°K 3=23364
 halides, high freq. dielectric props., rel. to point defect
 interaction 3=22974
 halides, i.r. absorpt. mechanism 3=17994
 halides, ionic conductivity, polarization effects 3=22977

Alkali metal compounds — contd

- halides, lattice dynamics, "shell model" 3=20075
- halides, lattice energy, calc. 3=17627
- halides, low-energy electron absorption coefficients 3=22694
- halides, luminesc. of X-rayed, plastically deformed crystals 3=4983
- halides, M-centres, X-ray generation 3=22845
- halides, n.m.r. chemical shifts 3=8731
- halides, plasma oscillations; optical data evidence 3=10908
- halides, point defect formation rel. to irradi. 3=22730
- halides, polarizability of ions 3=12909
- halides, positron long lifetime meas. 3=20148
- halides, pure and Cu-doped, luminesc. 3=20505
- halides, radiation effects at low temp. 3=22835
- halides, secondary ion and electron emission in bombard. with K ions 3=5723
- halides, solid solutions, NaCl type, heat of formation 3=13390
- halides, solutions, supersaturated, latency times 3=21339
- halides, specific heats and spectroscopic behaviour 3=754-65
- halides, spin—lattice relax. rel. to temp. and vibrational spectrum 3=23249
- halides, structure factors, for inelastic neutron scatt. 3=22643
- halides, theory of Cauchy's reln. 3=25600
- halides, thermal expansion, compressibilities, and temp. derivatives 3=13389
- halides, thermodyn. props., Debye temps., temp. depend. 3=22667
- halides, thermoluminesc. after X-irrad. 3=3073
- halides, vac. u.v. optical properties 3=10964
- halides, vacancy—dislocation equilibrium 3=22749
- halides with impurities, light scattering 3=20451
- halides, with NaCl structure, lattice dynamics and spec. ht. 3=8350
- halides, X-ray line broadening, and strain 3=8934
- halides, Ag ions, optical absorption analysis 3=10965
- halides, Ca, Cd, Co doped, F and Z bands 3=13012
- halides, Cu-doped, luminescence, mechanism 3=6667
- halides, CuBr activated, luminesc. narrow bands 3=3040
- halides, Tl-activated, luminesc. centres 3=18023
- halides, U → F conversion and photocond. 3=20248
- hexaborides, thermal conductivities 3=25210
- hydride molecules, pot. energy curves and binding nature 3=17569
- hydride molecules, potential energy of excited states 3=12815
- iodides, unactivated, luminescence 3=18024
- metaborate vapours, i.r. spectra, bond structure 3=25808
- permanganates, decomposition, by thermogravimetry and i.r. absorpt. 3=16161
- salts, fused, Verdet consts. and rotativity, 5461 Å 3=13158
- thermoluminescence, by spectrophotometer, rapid scanning, automatic 3=18992

Alkaline earth metals

- See also the individual metals.
- in acetylene flame, ionization and dissociation processes 3=23542

Alkaline earth compounds

- See also the compounds of the individual metals.
- aluminates, activated, luminescence 3=25479
- fluorides, colour centres, expt. data 3=15516
- fluorides, Sm³⁺ and Eu³⁺ activated, luminescence, deformation line-splitting 3=18025
- fluorides, spectra of incorporated Ce³⁺ 3=25452
- halides, heats of fusion and transition 3=19065
- hexaborides, thermal expansion and melting point 3=20113
- oxide cathodes, products emitted when heated 3=4204
- oxides, thermal cond. of sintered powders 3=25209

Allotropes

- See Phase transformations.

Alloys

- See also Crystal structure, atomic, alloys; Steel; and under compounds of the individual elements. Alloys such as Au₃Cu, Au—Cu, Au—Cu—Zn are indexed under compounds of the first-named element, i.e. Gold compounds in these examples.

A—B, A₃—B, f.c.c., antiphases 3=20881

Alloys — contd

- AB type, electronic screening, ordering energy 3=8899
- Alnico, magnetic hysteresis a.c. integrals, residual to saturation mag., ang. var 3=25526
- anodic polarization curves of binary alloys 3=11350
- binary, clustering kinetics 3=13536
- binary, det. of component by β-ray backscatt. 3=11278
- binary disordered alloy, residual resistivity, 1-electron binary, short range order effects 3=8901
- binary, sound absorption, effect of addition of third element 3=23489
- binary, stacking faults, thermodynamics 3=12989
- α-brass, work hardening, shear, 4.2–500°K 3=20725
- β-brass, martensite formation, during electrolytic thinning of foil 3=8891
- brasses, elec. resistivity, abnormal, criticism of conclusions 3=15535
- bronzes, Al, elec. resistivity, abnormal, criticism of conclusions 3=15535
- cast, eutectic, elec. resist. rel. to composition 3=20262
- constitution and thermodyn. activity diagrams 3=5118
- constitution diagrams, for b.c.c. lattices, AB and A₃B long-range order 3=3325
- crystal electron states, energy splitting, calc., binary orderable 3=17688
- crystallization in unsteady-state conditions 3=21623
- crystallization of supercooled binary systems 3=21624
- deformation, from calorimeter, liquid—gas film 3=19058
- deformation ageing, general theory 3=20723
- diffusion, under elec. field, new meas. technique using tracers 3=20235
- dilute, defects, single and interacting, density matrix treatment, self-consistent 3=22700
- dilute, electronic structure 3=8388
- dilute, transport props. 3=8382
- directional order, mag. induced, correl. with AB, super-lattice 3=18072
- disordered system, wave-function 3=9349
- EI-437A, precipitation by anodic dissoc. 3=8913
- EI-437A, thermal expansion, 20–500°C 3=2735
- electrical cond., correl. with temp. coeff. of resist. 3=15534
- electrical conduct., rel. to long-range order 3=17814
- electrical resist., residual, for periodically varying composition 3=20260
- electron microscope exam. by replica, Cr—C 3=18426
- electronic structure, rel. to n.m.r. 3=23245
- electronic structure, rel. to size effects, chemical interactions, compressibility 3=22757
- Elinvar, mag. props., temp. depend. 3=11053
- eutectics, binary, lamella—rod transition 3=25758
- eutectic, microstruct., impurity effects 3=13509
- eutectic, quenched ideally, degree of non-equilib. 3=13533
- eutectics, nucleation, rel. to structure 3=13503
- f.c.c., directional order, mag. induced 3=18073
- fatigue hardening, for low stacking-fault energy 3=20736
- ferromagnetic, Curie—Weiss constant 3=13243
- ferromag., effective Curie—Weiss const., no. of mag. carriers 3=8666
- ferromagnetic, ordering, theory 3=25518
- ferromag; props rel. to d-electron Stark splitting 3=6645
- focusing collision chains, theory 3=22882
- friction, high temp. 3=20764
- hyperfine field 3=8342
- i.r., absorpt. in dilute alloys, theory 3=8589
- impurities interact. with quenched-in vacancies 3=8424
- intermetallic cpds., grain boundary brittleness 3=11184
- Invar, magneto-diffusion, from internal friction, 0–440°C 3=11090
- Ising model, dimer statistics 3=14043
- Ising model, with impurities, spin-pair correl. function 3=25162
- Ising model series, coeffs., asympt. form 3=16546
- Ising model, time-depend. statistics 3=14045
- Ising model, two-dim., spin correlations 3=13239
- Ising systems with long-range forces, stochastic fields 3=23779
- liquid, surface tension 3=121
- load—elongation curve, rel. to composition 3=20710
- magnetic, dilute, resistivity at low temps. 3=8487

Alloys — contd

- magnetic, resistivity anomalies, electron spin-dependent scatt. 3=25319
- magnetic structure and properties, mechanical factors effect 3=8634
- Magnox AL80, creep props. 3=8771
- mechanical properties under high pressure 3=18157
- mechanical strength, short-range order mech. 3=6797
- metals and alloys, shear waves, finite amplitude 3=25182
- Monel, Curie point, by simple balance method 3=8636
- molten, dilute, interaction parameters 3=16603
- molten, ferromag. susceptibility, rel. to concentration 3=23905
- neutron diffr., "null matrix" method 3=13585
- nichrome, deformed, crystal dislocations, structure changes/on heating 3=17747
- Nichrome films, vacuum dep., strain sensitivity 3=23514
- n.m.r., effect of non-mag. impurities 3=8729
- orbital diamag. suscept. of cond. electrons 3=20556
- order-disorder transition due to single-vacancy migration 3=13530
- ordered, domain structrs., anti-phase 3=1357
- ordered, work hardening, theory 3=1233
- ordering in b.c.c. alloys with 4 kinds of site 3=8904
- ordering, two-time Green functions method 3=11292
- paramagnetism, rel. to short range order 3=3085
- permalloy, films, conductivity, electrical, and coercivity 3=13041
- Permalloy films, ferromag. resonance 3=20633
- Permalloy films, isotropic, mag. props. 3=23169
- Permalloy films, mag. anisotropy 3=11057
- Permalloy (78,83) films, mag. anisotropy, 1 Mc/s 3=15828
- Permalloy films, magnetic anisotropy dispersion and error function 3=20601
- Permalloy films, mag. domains, evaporated on cleaved NaCl 3=20931
- permalloy, mag. easy axis, max. dispersion 3=15808
- Permalloy 66, internal friction, due to ordering 3=11137
- phase transform., growth of diffusion-limited centre 3=5127
- phase transformations, second kind, ordering kinetics 3=6864
- precipitation hardening, effect of insonation 3=16109
- preferred orientation during freezing 3=1269
- rapidly-cooled specimen production device 3=20911
- residual elec. resistivity, for b.c.c. lattice with 2 ordering temp. 3=3317
- rigid-band model, energy surface distortion 3=8391
- secondary recrystallization, in polycrystals, with macroscopic pores 3=3336
- semiconductor, lattice thermal conductivity, theory 3=25207
- semiconductor, thermal conductivity at high temps. 3=10616
- short-range order 3=8905
- size, chemical interaction effects 3=8389
- solidification, solute behaviour obs. 3=16838
- spectrochemical analysers, U.S.S.R., U.K., U.S.A., performance 3=25848
- stacking faults determ. by electron micr. 3=12993
- strain ageing just below crit. ordering temp. 3=8775
- structure and phase state rel. to spontaneous magnetization 3=1350
- superconducting, magnetization curve, near 2nd critical field 3=24141
- superconducting, non-mag., near transition point 3=12028
- superconducting, sound absorption 3=1899
- superconducting, upper critical field 3=329
- supercond., electron scatt. by impurities 3=9674
- superconductivity, impurity effects and crit. current 3=9679
- superconductivity, persistent currents theory 3=16870
- superlattices, plastic deformation 3=23319
- tetragonal, lattice parameters, by graphical extrapolation 3=6837
- thermo-e.m.f., rel. to temp. and composition, theory 3=4957
- transition elements in normal metals, low temp. props. 3=8496

Alloys — contd

- transition metal, superconducting, upper crit. fields 3=3949
- twinning rel. to martensite formation, temperatures 3=11288
- vacancies, point defects, atomic displacement rel. to neutron irradi. 3=10702
- Vicalloy II, mag. hardness and internal stresses 3=1139
- wear, high temp., decrease due to oxide layer 3=20764
- Al—Mo, growth rate on Mo from Al solns. in liq. metals 3=3344
- AlNiCo alloys, coercivity, improvement? 3=15795
- AlNiCo 500, AlNi, magnets, structural constituents, by microsonde and microhardness 3=16090
- Alnico, magnet, sintered, crystal structure 3=16094
- Cu, containing Bi brittle phase, dihedral angle 3=13499
- Cu₃Au-type, ordered, reduced mobility of divacancies 3=12961
- Cu—Mn, polycryst., mag. props. rel. to temp. and field 3=4997
- Ge, solubility of impurities, maximum, and m.p. distrib. coeff. 3=20910
- Hg—0.1% Au, transverse transport coeff. 3=3814
- Ni—Fe, volume magnetostriction 3=6713
- Ni₈₀Fe₁₇Co₃, films, varn. of dispersion angle with thickness 3=8675
- Si, solubility of impurities, maximum, and m.p. distrib. coeff. 3=20910
- U-fission alloys containing Tc, phase relns. 3=5130
- Alpha-particles and helium nuclei**
See also Alpha-rays.
- α -particle, variational wave-functions 3=12520
- binding energy for hard-core potls. 3=12558
- binding energy for vel.-depend. potls. 3=12559
- excitation by 150 MeV π^- mesons 3=4474
- excited state, from D—T reaction 3=2327
- excited states, from p—He³ scatt. 3=6005
- hypernucleus, decay, non-mesonic 3=12569
- production in carbon and polyethylene by 26.6 GeV/c protons 3=24717
- scattering of deuterons, elastic, at 6-14 MeV, diff. cross-sections 3=611
- virtual state, study using T(d, pn)T 3=2331
- C¹³, α -cluster model 3=12551
- He³, binding, three-body force effects 3=22215
- He³, Coulomb energy calc., symmetry importance 3=17358
- He³, 80-500 MeV, from cosmic-ray disintegration 3=17359
- He³, inelastic scatt. from deformed nuclei, rel. to coupling potential 3=19885
- He³ nucleus, radius, Coulomb energy 3=12519
- He³, polarization, by optical pumping of He³ gas 3=12523
- He³, polarized, by optical pumping of 2³S, atoms 3=15050
- He³, prod. by p, at 28 GeV, with t and d, high energy momentum spectra, theory 3=15198
- He³, 29 MeV, scatt. by Au, polarization 3=24976
- He³—e scatt., elastic, form factor analysis 3=24695
- He³—He³ scattering, elastic, 3 - 12 MeV 3=12521
- He³—He⁴ scatt., rel. to Be⁷ excited states 3=12522
- He³ + γ → p + d, 8.5-22 MeV, 90° differential cross-sections 3=19716
- He³ + μ^- → H³ + ν , reaction rate, final results 3=7881
- He⁴—He³ scatt., spectator exchange terms 3=15051
- He⁴, lifetime 3=15088
- He⁴ states, from He⁴ + n, 20-29 MeV 3=15099
- He⁴, β -decay 3=10182-3
- Λ He⁴, lifetime, from emulsion decays 3=10233
- Λ He⁴ → π^+ + H³ + n 3=7976
- Λ He⁴, lifetime, from emulsion decays 3=10233
- Λ He⁴, non-mesonic decay 3=6146
- π scatt., elastic, at 300 MeV 3=10154
- Alpha-ray spectra**
See also Nuclear decay theory.
- energy distribution, rel. to source thickness 3=12525
- from (n, α) reactions on heavy nuclei, 14.7 MeV 3=19864
- (γ , α) reactions on medium wt. nuclei 3=15179
- in Formvar, 169keV α -particles 3=7938
- (n, α) and (n, na) in KI(Tl) and CsI(Tl), 12.1 to 21.5 MeV 3=2479
- odd-mass nuclei, A>230, fine structure of nuclear masses 3=6194

Alpha-ray spectra — contd

- (p, α) nuclear reactions at 30, 43 and 56 MeV 3=24936
 $\text{Al}^{27}(\text{n}, \alpha)\text{Na}^{24}$, 14 MeV neutrons 3=6264
 $\text{Al}^{27}(\text{n}, \alpha)\text{Na}^{24}$, 14 MeV 3=19863
 $\text{Al}^{27}(\text{p}, \alpha)\text{Mg}^{24}$, 1-25 MeV 3=19847
 $\text{Al}^{27}(\text{p}, \alpha)\text{Mg}^{24}$, 3 to 12 MeV 3=17468
 Am^{241} 3=15162
 Am^{241} decay 3=2421
 $\text{As}^{75}(\text{n}, \alpha)$ at 14 MeV 3=6265
 $\text{B}^{10}(\text{n}, \alpha)\text{Li}^7$ rel. to $\text{B}^{10}(\text{n}, \alpha)\text{Li}^7$ 3=674
 B^{12} , following beta-decay 3=15138
 Be^{8*} 3=10250
 $\text{Be}^8(\text{He}^3, \alpha)\text{Be}^8$, heavy particle stripping 3=19882
 $\text{Bi}^{210\text{m}}$ 3=19824
 $\text{C}^{12}(\alpha, 4\alpha)$ 3=2495
 $\text{C}^{12}(\alpha, 4\alpha)$, at 23 MeV 3=4671
 C^{12} —p reaction, 660 MeV, cascade 3=2462
 $\text{Ca}^{40}(\text{n}, \alpha)$ reaction, ang. distrib. 3=22408
 $\text{Cd}(\gamma, \alpha)$, 21 and 30 MeV 3=15179
 Cf^{249} decay 3=19826
 $\text{Co}^{59}(\text{n}, \alpha)\text{Mn}^{56}$, 14 MeV neutrons 3=6264
 CsI:Ti (n, α), 14 MeV 3=12689
 $\text{Cu}(\gamma, \alpha)$, 21 and 30 MeV 3=15179
Eu isotopes, neutron deficient 3=2413
Gd isotopes, neutron deficient 3=2413
 He^3 —t reactions at 1.9 MeV 3=7939
Hg, neutron deficient isotopes 3=659
 $\text{In}(\text{n}, \alpha)\text{Ag}$ 3=2475
 $\text{Li}^6 + \text{Li}^7 \rightarrow \alpha + \text{Be}^8$ 3=8137
 $\text{Li}^7(\text{p}, \alpha)\text{He}^4$, 1.12 to 3.58 MeV 3=8099
 $\text{Li}^7(\text{p}, \alpha)\text{He}^4$, at 3.3-6.6 MeV 3=6245
 $\text{Li}^7 + \text{d}$ reactions, breakup of Be^{8*} 3=10383
 Li^8 theory 3=24890
 $\text{Mn}^{55}(\text{n}, \alpha)$ at 14 MeV 3=6265
 $\text{Na}^{23}(\text{n}, \alpha)$ at 14 MeV 3=6265
 N^{12} , following positron decay 3=15138
 $\text{N}^{15}(\text{He}^3, \alpha)\text{N}^{14*}$ 3=6162
 $\text{Ni}(\gamma, \alpha)$, 21 and 30 MeV 3=15179
 Np^{237} decay 3=4605
 Pa^{231} decay, fine structure 3=2420
Pb, neutron deficient isotopes 3=659
 $\text{Po}^{200, 201, 203}$ 3=10316
Pt isotopes 3=17444
Pt, neutron deficient isotopes 3=659
 Pt^{190} 3=4602
 Pu^{239} 3=15160
 Pu^{239} decay 3=4606
 Pu^{239} , fine structure 3=10319
 $\text{Pu}^{238, 239, 240, 241}$, Am^{241} mixture, intense 3=15161
 Ra^{226} , and its derivs. 3=4604
 $\text{Si}(\text{n}, \alpha)\text{Mg}$, 6-9 MeV n's 3=19867
 $\text{Si}^{28}(\text{n}, \alpha)$, up to 5.5 MeV 3=10359
Te, neutron deficient isotopes 3=659
Th decay, in emulsion, abnormally long tracks 3=22320
Th spallation reactions 3=6251
 Th^{232} 3=19824
Tl, neutron deficient isotopes 3=659
 $\text{V}(\gamma, \alpha)$, 21 and 30 MeV 3=15179

Alpha-ray spectrometers

- inert gases, ionization props. 3=7424
for meas. decay periods, short 3=8023

Alpha-rays

- See also Alpha-particles; Cosmic rays, alpha-particles;
Radioactivity.
 α -N interact., separable potl. model 3=2332
beam prodn., 19 MeV and 20 μA current 3=7650
decay of Po isotopes, reduced derivative width
 δ_L^2 3=10317
even-even, α -decay 3=12616
Formvar, α -energy loss, 169 keV 3=7938
prod., by p, at 9 GeV, in emulsion 3=19623
radioactivity decay, semiclassical approx. 3=22319
transfer, in collisions between nuclei 3=6296
 Ac^{228} decay 3=17446
 At^{212} 3=2419
 At^{212} 3=15157
 Cf^{249} decay, rel. to temp. 3=4608
 Cm^{247} , lower limit to half-life 3=19825

Alpha-rays — contd

- E^{253} decay, rel. to temp. 3=4608
 Er^{152-4} , near 82-neutron closed shell 3=24907
 $\text{He}^3(\gamma, \text{pd}^3, \text{He}^3(\gamma, \text{n})2\text{p}$, up to 170 MeV 3=19715
 He^4 , capture of μ^- , rate 3=6026
 Ho^{161-3} 3=12637
 $\text{Ne}^{20}(\alpha, \alpha'\gamma)\text{Ne}^{20}$, α - γ coincidences 3=2498
 Po^{210} , M photon emission, intensity meas. 3=15156
 $\text{Po}^{210\text{m}}$ 3=6193
 $\text{Po}^{186, 188, 200, 204}$, α -decay ratio to overall decay 3=22317
 $\text{Pu}^{238, 239, 240}$ 3=22351
 $\text{Pu}^{238, 240}$, decay to vibr. states, meas. 3=15129
 Ra^{226} , and its derivs. 3=4604
Th and U content of australites 3=7025
 Th^{230} , decay to vibr. states, meas. 3=15129
 $\text{U}^{234, 235}$, decay to vibr. states, meas. 3=15129
- absorption**
explosives, range-energy relationships 3=17279
VYNS films, energy loss at 4-30 keV 3=4394
 Al_2O_3 films, energy loss at 4-30 keV 3=4394
C films, energy loss at 4-30 keV 3=4394
in Si, range-energy relationship for α and He^3 3=17113
- angular distribution**
angular correlations, α - γ , measurement 3=24882
from (n, α) reactions on light nuclei, 14 MeV 3=10362
(p, α) nuclear reactions at 30, 43 and 56 MeV 3=24936
peaks near 180°, due to compound nuclear levels 3=17459
photonuclear reactions, rel. to surface nuclear shape
and optical anisotropy 3=15087
rel. to source thickness 3=12525
 $\text{Al}^{27}(\text{d}, \text{He}^3)\text{Mg}^{26}$ 3=8125
 $\text{Al}^{27}(\text{n}, \alpha)\text{Na}^{24}$, 14 MeV, forward-backward
asymmetry 3=10367
 $\text{Al}^{27}(\text{n}, \alpha)\text{Na}^{24}$, 14 MeV neutrons 3=6264
 $\text{Al}^{27}(\text{n}, \alpha)\text{Na}^{24}$, 14 MeV 3=19863
 $\text{Al}^{27}(\text{p}, \alpha)\text{Mg}^{24}$, 1-25 MeV 3=19847
 $\text{Al}^{27}(\text{p}, \alpha)\text{Mg}^{24}$, 3 to 12 MeV 3=17468
 $\text{Am}^{241, 243}$, α - γ ang. correl., perturb. by environ-
ment 3=4607
 Am^{243} , α - γ ang. correl. rel. to mag. fld. 3=6211
 $\text{As}^{76}(\text{n}, \alpha)$ at 14 MeV 3=6265
 As^{76} (p, α) Ge^{72} , 8-14 MeV 3=24935
 $\text{B}^{10}(\text{d}, \alpha)\text{Be}^8$ 3=19874
 $\text{B}^{11}(\text{p}, \alpha)$, 140-550 keV 3=2452
 $\text{Be}^8(\text{d}, \alpha)\text{Li}^7$, 13.6 MeV, for ground and excited
states of Li^7 3=22425
 $\text{Be}^8(\text{He}^3, \alpha)\text{Be}^8$, heavy particle stripping 3=19882
 $\text{Be}^8(\text{He}^3, \alpha)\text{Be}^8$, 2.0 MeV 3=22269
 $\text{Be}^8(\text{p}, \alpha)\text{Li}^6$, at 15.6 and 18.6 MeV 3=2454
 $\text{Bi}(\text{p}, \alpha)$, 240-600 MeV 3=22385
 C^{12} , 15 to 22.7 MeV backward scatt. 3=2494
 $\text{C}^{12}(\alpha, 4\alpha)$ 3=2495
 $\text{C}^{12}(\alpha, 4\alpha)$ at 23 MeV 3=4671
 $\text{C}^{12}(\text{d}, \alpha)\text{B}^{10}$ 3=8124
 $\text{C}^{12}(\text{d}, \alpha)\text{B}^{10}$, 15-20 MeV 3=22418
 $\text{C}^{12}(\text{C}^{12}, \alpha)\text{Ne}^{20}$ 3=19889
 $\text{C}^{12}(\text{p}, \alpha)\text{B}^9$, at 15.6 and 18.6 MeV 3=2454
 $\text{C}^{12} + \text{C}^{12}$, 123 MeV 3=17500
 $\text{C}^{12} + \text{Li}^6 \rightarrow \text{N}^{14} + \alpha$ 3=8136
 $\text{C}^{13}(\text{He}^3, \alpha\gamma)\text{C}^{12}$, α - γ ang. correls. 3=2496
 $\text{C}^{14}(\text{p}, \alpha)\text{B}^{11}$, at 18 MeV 3=671
 Cm^{243} , α - γ ang. correl., perturb. by environment 3=4607
 $\text{Co}^{59}(\text{n}, \alpha)\text{Mn}^{56}$, 14 MeV neutrons 3=6264
 $\text{Cu}^{63, 65}$ (p, α), 8-14 MeV 3=24935
 $\text{F}^{19}(\text{p}, \alpha)\text{O}^{16}$, $E_p < 35$ MeV, peaks near 180° 3=17459
 $\text{F}^{19}(\text{p}, \alpha)\text{O}^{16}$ 3=6244
 $\text{F}^{19}(\text{p}, \alpha)\text{O}^{16}$, 3-12 MeV meas. 3=22379
 Fe^{56} (p, α) Mn^{53} 3=24934
 He^3 ang. distrib. from $\text{Li}^6(\text{p}, \alpha)\text{He}^3$ 3=12664
 $\text{In}(\text{n}, \alpha)\text{Ag}$ 3=2475
 $\text{Li}^6 + \text{Li}^6 \rightarrow \text{Be}^8 + \alpha$ 3=6299
 $\text{Li}^6(\text{p}, \alpha)\text{He}^3$, up to 5 MeV 3=17460
 $\text{Li}^7(\text{p}, \alpha)\text{He}^4$, at 15 and 18.6 MeV 3=2454
 $\text{Li}^7(\text{p}, \alpha)\text{He}^4$, 1-12 to 3.58 MeV 3=8099
 $\text{Li}^7(\text{p}, \alpha)\text{He}^4$, 3.0 to 5.5 MeV 3=17461
 $\text{Li}^7(\text{p}, \alpha)\text{He}^4$, 3.3-6.6 MeV 3=6245
 Mg^{24} , fourth excited state, 22.5 MeV 3=15229
 $\text{Mg}^{24}(\text{p}, \alpha)\text{Na}^{23}$ 3=17467
 $\text{Mn}^{55}(\text{n}, \alpha)$ at 14 MeV 3=6265
 N^{14} , 15 to 22.7 MeV backward scatt. 3=2494

Alpha-rays — contd

angular distribution — contd

- Na²³(n, α) at 14 MeV 3=6265
- Na²³(p, α)Ne²⁰, 3-12 MeV 3=19849
- Ni^{58,60}(p, α)Co 3=24934
- O¹⁶, 15 to 22.7 MeV backward scatt. 3=2494
- O¹⁶(d, α)N¹⁴, 15-20 MeV 3=22418
- O¹⁶(d, α)N¹⁴ 3=8124
- O¹⁸(p, α)N¹⁵, 730-1050 keV 3=24932
- Rh¹⁰³(p, α)Ru¹⁰⁰, 8-14 MeV 3=24935
- Si²⁸, fourth excited state, 22.5 MeV 3=15229
- U²³⁸, fission by 14 MeV neutrons 3=8144
- Zn^{64,66}, scatt., low-lying groups 3=2491
- detection, measurement**
 - See also Alpha-ray spectrometers; Dosimetry;
 - Particle detectors; Radioactivity measurement.
 - alpha gauge, for small density meas. 3=3781
 - counters, scintillation, organic difference from e pulses 3=17103
 - energy meas., 5-30 MeV 3=24812
 - ionization chamber, filled with toluene—argon and n-heptane—argon 3=4291
 - nuclear emulsion track lengths, effects of damp 3=19535
 - p-i-n detector, particle discrimination 3=17115
 - semiconductor counter, large higher energy proton background 3=4478
 - solid-state detector 3=4479
 - spark counter, multiwire 3=24545
 - spectrometer, high-resolution, ionization 3=12524
 - CdS, use for α -particles detection 3=6594
 - Li⁶ + Be⁹, α - γ coincidences 3=19157
 - Si junction detector, 6-9 MeV 3=2930
 - Th decay, abnormally long track from star 3=22321

effects

- See also Nuclear reactions, alpha-rays.
- anthracene, luminescence excitation 3=11005
- anthracene, scintillation, temp. depend. 3=18045
- electron capture, passing through He atom 3=9720
- gas mixtures, binary, ionization meas. 3=21699
- gelatine, water solubility 3=5170
- inert gases, ionization 3=7424
- inert gases, luminescence 3=21448
- ionization, energy per ion 3=14522
- ionization in gases, slow component search 3=9724
- luminescence, gases, weak, meas. 3=21447
- metals, He bubble formation 3=25314
- para-terphenyl, scintillation, temp. depend. 3=18045
- supercurrent destruction 3=12026
- trans-stilbene, scintillation, temp. depend. 3=18045
- use in gyromagnetic ratio meas. 3=24837
- Al and Al alloys, swelling, metallog. study 3=4896
- Al crystal, point defects and cond., magnetoresist., Hall coeff. temp. var. 3=17816
- Au, stacking-fault tetrahedra and black spots, rel. to irradi., 1-3.5 MeV 3=17770
- CdS, current impulses, effect of contact 3=6594
- Cu, loops and black spots, rel. to irradi., 1.5 MeV 3=17770
- Cu, crystal, point defects and cond., magnetoresist., Hall coeff. temp. var. 3=17816
- He II liquid, luminescence, inhibition below λ point 3=21644
- Kr, luminescence, weak, 2400-5000 Å 3=21447
- Pt foils, dislocation loops, fission and α -part. irradi. 3=8437
- Si, electron-hole pair prod. 3=17677
- W, grain boundaries 3=17775
- Xe, luminescence, weak, 2400-5000 Å 3=21447
- Zn, stress/strain curves 3=18174
- ZnS, scintillation, field quenching 3=13208

scattering

- α - α , to investigate Be⁹ ground state 3=6094
- α - α , low-energy, rel. to Regge poles 3=4477
- α -n, 2 to 24 MeV 3=19636
- backscattering on surfaces, rel. to chemical analysis 3=8991
- by even nuclei in range $106 \leq A \leq 154$ 3=12576
- DWBA validity range 3=19829
- light nuclei, exchange effect 3=17496
- of n, 15 MeV, D-wave contrib. 3=19644

Alpha-rays — contd

scattering — contd

- nuclei, inelastic, distorted-waves theory 3=6294-5
- nuclei, vibr. levels excitation, theory 3=7085
- optical potential ambiguities 3=22361
- p, 39.8 MeV, polarization, phase-shift analysis 3=24729
- p-He⁴, and potential, 40 MeV 3=22256
- p-He⁴, 22-48 MeV, p polarization 3=22131
- p-He⁴, 38.4 MeV, p polarization, phase-shift analysis 3=22132
- spherical even nuclei, 3-phonon vib. states excitation 3=22286
- Au, 13-30 MeV, differential cross-sections 3=17497
- by C, elastic, and Regge poles 3=8130
- C, 13-30 MeV, differential cross-sections 3=17497
- C¹², 15 to 42 MeV 3=17496
- C¹², 15 to 22.7 MeV, backward 3=2494
- Fe^{56,58}, excitation of collective "2-phonon" levels, 44 MeV 3=24864
- He³, by C, F, S, Br nuclei, elastic, 29 MeV, optical model analysis 3=2493
- He³, by N¹⁴ and O¹⁶, elastic, inelastic, optical model analysis 3=2492
- He³, resonating-group struct. in one-channel approx. 3=24811
- on He⁴, elastic, 3.8-12 MeV 3=10386
- He⁴-He³, spectator exchange terms 3=15051
- Mg, 13-30 MeV, differential cross-sections 3=17497
- Mg²⁴, fourth excited state, 22.5 MeV 3=15229
- Mn⁵⁵ and Ho¹⁶⁵, 43 MeV, elastic 3=19828
- N¹⁴, 15 to 22.7 MeV, backward 3=2494
- Ni^{62,64}, excitation of collective "2-phonon" levels, 44 MeV 3=24864
- O, 13-30 MeV, differential cross-sections 3=17497
- O¹⁶, 15 to 22.7 MeV, backward 3=2494
- Si²⁸, fourth excited state, 22.5 MeV 3=15229
- by Zn^{64,66}, 43 MeV 3=2491

Altimeters

No entries this year

Aluminium

- absorption, acoustic waves, u.s., stress effects, time var., 5-200 Mc/s 3=22648
- adsorption of CO and CO₂ 3=3359
- annealing, recrystallization and polygonization 3=3335
- anodized surface, visual appearance 3=16460
- atom, spectrum, oscillator strengths 3=15279
- atoms and ions, self-consist. field calcs. 3=22476
- Bauschinger effect and dislocation arrangements 3=17746
- bicrystals, growth rate rel. to misorientation 3=11223
- block misorientation rel. to strength 3=11193
- bombardment with Ar ions, effects 3=10706
- cathodes, tunnel, hot electron energy distrib., from emission 3=19301
- cold deformed, lattice distortion relaxation curves, X-ray reflections 3=3288
- cold working, effect on hardness and conductivity, electrical 3=13373
- creep, effects of crystal stress orientation, temp. 3=11161
- critical shear stress, substructure effects 3=23350
- cross-slip and stacking-fault energy 3=1230
- crystal defect elimination, by rolling in liquid H 3=16089
- crystal, electron diffraction, rel. to thermal vibrations 3=1296
- crystal growth, impurity removal and distrib. 3=3265
- crystal point defect clusters, on ion bombard., obs. by electron microscopy 3=20159
- crystal vacancy clusters, effect of quenching and impurities 3=20162
- crystallite orientation distrib. 3=25783
- crystals, dislocations revealed by etching 3=15497
- crystals, electron micrographs 3=11334
- crystals, hardness anisotropy 3=3246
- cyclic hardening and softening, dislocations 3=20738
- cyclotron reson., 3.6×10^{10} c/s 3=17696
- damage by electron-irradi., low temp. 3=22860
- Debye-Waller factor for electron diffr. 3=22656
- Debye-Waller factor, 4° to 500° K 3=20082
- defect structure rel. to quench deformation 3=6515
- defect structures rel. to n-irradi. 3=17735
- defects, effect on corrosion 3=6919

Aluminium — contd

- defects when quenched and aged 3=10667
- deformation striations, etching, electron microscope exam. 3=23534
- de Haas—van Alphen effect, 35 kG 3=20559
- deuteron irradi., low-temp., annealing 3=13021
- diffusion of d, by $d + d \rightarrow He^3 + n$ 3=17352
- dislocation arrangements due to tensile stresses 3=20754
- dislocation damping, neutron irradi. effects 3=4868
- dislocation loop growth on irradi. with fission fragments 3=6520
- dislocation loops, quenched, stability 3=4878
- dislocation structure during cyclic strain 3=17749
- dislocations, interstitial loops 3=4870
- dislocations, new etching method 3=4876
- dislocations prod. by spark discharge 3=12969
- elastic scatt. of O^{16} ions 3=19891
- elec. resistance, 4.2° - 1.65° K, rel. to sample size 3=2851
- elec. resistance, 20° - 58° K 3=2852
- electrical resistance, rel. to vacancies, dislocations and stacking faults 3=22891
- electrode in electrolytic bath, radiation spectrum 3=1395
- electron beam energy losses rel. to diffraction patterns 3=2779
- electron effective masses rel. to de Haas—van Alphen effect 3=22693
- electron emission charac. in gases 3=418
- electron emission due to Ar^{+} bombardment 3=9843
- electron emission, exo; photo-stimulated, stretched foil 3=7627
- electron emission, secondary, by relativ. primaries 3=16979
- electron energy loss by bremsstrahlung at 1 MeV 3=17699
- electron irradi. effects, recovery study 3=15489
- electron microcharacteristics meas., by optical constants 3=15467
- electron-probe microanalysis 3=11366
- electron scatt. at surface, energy losses 3=4858
- electron scatt. by films, background intensity 3=4202
- electron scattering, energy loss 3=2040
- electron transmission, 100-472 keV 3=14961
- electropolishing and growth of oxide spirals 3=1261
- etching by ion bombardment, electron micr. study 3=18241
- evap. in u.h. vac., i.r. reflectance 3=20443
- fatigue investigation 3=18213
- fatigue, tension—compression, stress—strain relns. 3=11139
- fatigue, torsional, dislocation processes 3=25609
- fatigued, substructure and fracture process 3=20742
- Fermi surface 3=20133
- Fermi surface, from de Haas—van Alphen effect 3=1121
- Fermi surface, magnetoacoustic meas. 3=17682
- Fermi surface, theory 3=17683
- film on Ag, Pd, Ni, structure 3=1371
- films, characteristic electron-energy losses 3=5712
- films evap. from W heaters, W content meas. 3=1364
- films, evaporated, elec. cond. and Hall const. 3=8494
- films, oriented, growth on alkali halide substrates 3=18254
- films, reflectivity, decrease due to oxidation 3=23039
- films, superconductivity 3=14447
- films superconductivity and normal cond. rel. to adsorbed O 3=16872
- films, thin, cooled layers, elec. cond. and Hall const. 3=4906
- films, transverse electric field effects 3=15541
- films, vacuum u.v. reflectance 3=11883
- films, X-ray reflection, 1.54 Å, 500-3000 Å thick 3=23093
- foil, 60 μ thick, quenched, dislocation loops with stacking fault 3=2804
- fracture, creep, obs. by electron microscope 3=8782
- fusion curve, at high press. 3=6814
- glide, secondary, near grain boundaries 3=5069
- grain boundaries, stress behaviour 3=18177
- Grüneisen γ , temp. depend. calc. 3=10607
- Hall effect, high-field, at 4.2° K 3=840
- hardening, recognition criteria, temp. depend. 3=3230
- hardness relax. after cold deformation 3=11187
- heat of wetting, by hydrocarbons, in solution 3=16131

Aluminium — contd

- helicon oscillations det. 3=10728
- impact of radioactive projectiles 3=25646
- imperfections, etching obs. 3=20202
- impurity ions in Al, scattering cross-sections and charges 3=17813
- impurity nucleus, dynamics and γ -ray cross-section 3=20063
- internal friction rel. to strain amplitude 3=11138
- internal friction, var. with quenching temp. 3=15976
- internal friction, Young's modulus meas. 3=11135
- lattice defects after plastic deformation 3=20195
- lattice dynamics by axially symm. model 3=2711
- liquid, fluidity and prefreezing cluster formation 3=9437
- liquid, rate of soln. of transition elements 3=16614
- liquid, X-ray L_{23} emission spectrum 3=16628
- loop movement, rel. to fission fragment irradi. 3=17803
- luminescence, on electrolysis, near anode and cathode, flash spectra 3=10984
- luminescence, under electrolytic oxidation 3=10983
- magnetoacoustic oscill. and Fermi surface 3=22685
- magnetoacoustic resonance at 4.2° K 3=6469
- magnetoelectric effects, anisotropy in strong fields 3=22903
- magnetoresistance and Sondheimer oscillations 3=4908
- magnetoresistance, dimensional and purity effects at low temp. 3=15554
- magnetoresistance, transverse, low-temp, up to 20 kG
- mechanical strength, tensile, time var., low temp., anomalous 3=20729
- mechanical strength, torsion, and tensile strength—endurance relation 3=18208
- microdeformations, verification of linear elasticity theory 3=20684
- mirrors, Al—dielec., for interferometers 3=3889
- monocrystal, atomic ejection sequences by Ar^{+} ion bombardment, 50 keV 3=2845
- mosaic block disorientation meas. 3=10682
- n.m.r. 3=21997
- n.m.r. of Al^{27} , analysis by lattice harmonics 3=5047
- neutrons, damage, effect of plastic deformation, 1.8° K 3=6554
- nuclear reactor shielding meas., and "removal cross-section method" 3=17515
- optical constants, 300 to 800 Å 3=25434
- optical constants, vacuum u.v., Drude-like model 3=914
- optical const. meas., oxide effect elimin. 3=15646
- optical films, preparation and properties 3=9603
- orthogonalized plane wave form factors 3=25229
- oxidation, direct electron-microscope obs. 3=11336
- paramagnetic resonance in monocrystal 3=5036
- photoelectric emission, X-rays, 0.7-30 keV 3=14638
- plastic deformation, $\sim 600^{\circ}$ C 3=18185
- point defects in irradiated metal, review 3=8420
- polycrystalline, Hall field and resistivity rel. to imperfections, 20° K 3=4907
- polycrystalline, u.s. wave interaction 3=25191
- polygonization substructure evolution 3=10670
- porous, dynamic compression 3=6787
- powders, X-ray diffrn. line profiles 3=20817
- range of Be^9 ions in, at 2-21 MeV 3=2048
- range of 1-3 MeV Ne^{22} and Na^{24} 3=4640
- recrystallization and grain-boundary motion, effect of He 3=11222
- residual electrical resistivity, size effect 3=22890
- secondary electron emission, 1 MeV proton bombardment 3=24344
- shear modulus, rel. to stationary extended dislocations 3=25616
- shock-wave propagation 3=11856
- shock waves, nonhydrodynamic attenuation 3=21490
- sintering, rel. to pressure, time, temp. 3=6876
- slip line behaviour under stress reversal 3=8441
- slip, 350-400 $^{\circ}$ C, electron microscopy obs. 3=22793
- sound velocity, effect of high mag. field 3=8356
- spike formation on surface by Ar ions 3=22880
- sputtering by Ar^{+} , 1-2 MeV, preferential ejection 3=7656
- strain cycling, mech. hysteresis and geom. effects 3=20752
- stress/strain relationships, at 24° C 3=13340

Aluminium — contd

- stresses, internal, effect of cyclic strain 3=13345
- structure, cyclic, under large strain ranges 3=20740
- substructure formation, constant-strain fatigue 3=11328
- substructure of spherical crystals 3=23463
- superconducting, critical temp., containing Cr, Mn, Fe impurities 3=19105
- superconducting, magnetic behaviour, rel. to lattice defects 3=19104
- superconducting region, specific heat 3=12029
- superconducting, u.s. shear waves atten. 3=14446
- superconducting, up to 1 at.% impurities, forbidden band anisotropy, from specific heat, temp. var. 3=19106
- superconductive temp. controller, below 1°K 3=1880
- surface roughness, meas. by adsorption of I¹³¹ 3=13556
- swelling after α -ray irradi., metallography 3=4896
- tangled dislocations and narrow prismatic loops 3=17743
- thermal conductivity, oscillatory 3=20123
- thermoplastic oscillations 3=9380
- thin foils, electron scatt. intensities 3=1302
- thin layers, photoelectron emission velocity distrib. 3=9835
- triton range, 0.2-2.7 MeV 3=10180
- u.s. pulse propagation, 62 Mc/s 3=10592
- vacancy and interstitial loops, rel. to fission fragment bombardment 3=17706
- vacuum u.v. reflectivity, transmission and photoelectricity, 6 to 30 eV 3=13145
- vibration spectrum and specific heat 3=2714
- work hardening, surface effects of dislocations 3=1232
- X-ray diffraction, line intensities, temp. depend. 3=20864
- X-ray emission spectra, plasmon satellites 3=8607
- X-ray scatt., low angle 3=2072
- zone refining 3=20803
- zone refining 3=23487
- Al/Al₂O₃/Sn system, polar tunnelling characteristics 3=8543
- Al-water mixture, neutron transport 3=2272
- Al III spectrum, doublets, fine structure 3=10446
- Al XII, impurity in deuterium plasma, X-ray spectra 3=7581
- Al²⁷ n.m.r. in UAl₃ 3=8730
- Al²⁷(p, γ)/Si²⁸ reaction 3=19844
- Ar⁴¹ ions range, 0.7 keV-2.25 MeV 3=19372
- Kr⁸⁶ ion range, channelling 3=15521
- Rn²²² ions range, 2-450 keV 3=14676
- Sb diffusion in, under elec. field 3=22830
- Xe¹³³ ions range, 0.5-240 keV 3=19372
- 6061-T6 Al, eqn. of state, low-pressure 3=17667

Aluminium compounds

- alloys and compounds with Cr, Fe, Ni, K₂X emission, and K absorption 3=10974
- alloys, impurity electronic structure 3=22757
- alloys, physical props. rel. to structure 3=8877
- alloys, quenching defects, effect on pptn. 3=8909
- alloys, spectrochemical analyser, multichannel, photoelectric, performance. 3=25850
- alloys, superconductivity 3=16873
- alloys, vacancy-impurity binding energies 3=8424
- alloys with Mn, Cu, Si, microheterogeneities study 3=1347
- aluminates, Al-O, tetrahedral distance 3=25715
- aluminoborosilicate glasses, containing Fe, effect of Na₂O on elec. cond. 3=22936
- calcium aluminates, hydrated, i.r. spectra and H₂O behaviour 3=13165
- chlorites, theory of polymorphism 3=23370
- corundum, anisotropic spin-orbit coupling of d³ and d⁴ solutes 3=2694
- corundum, elastic compliances, temp. var. 3=13327
- corundum, heat capacity and enthalpy 500-2000° C 3=20103
- corundum, mag. suscept. of V³⁺ 3=20548
- corundum, spin-lattice- and cross-relaxation 3=6753
- corundum, Co²⁺ ion e.p.r. 3=6745
- corundum : Cr³⁺, spin-lattice interaction, 4-90°K 3=5037
- corundum, Cu²⁺ ion meas. 3=13300
- corundum, Fe³⁺ e.s.r., temp. depend. 3=5039
- corundum, Fe³⁺, mag. dipoles, transfer energy 3=13230
- corundum, Ti³⁺ e.s.r., theory 3=23237
- corundum, Ti³⁺ spin-lattice relax. time 3=6752

Aluminium compounds — contd

- cryolite (AlF₃·3NaF), films, structure from optical const., adsorption formation theory 3=13560
- duralumin, plastic flow on explosive loading 3=1224
- Duralumin used in microscope slide 3=16755
- electrocorundum, colour centres 3=15515
- ruby, crystal field and optical spectra, comparison with Cr₂O₃ 3=15675
- ruby, e.s.r. absorption of 9·3 kMc/s phonons 3=1190
- ruby, fluorescence yield, wavelength depend. 3=25484
- ruby, internal field, non-uniformity, and maser operation 3=20048
- ruby, laser action in ring sample 3=9972
- ruby, laser beam mixing with CaWO₄:Nd³⁺ beam in piezoelec. crystals 3=7359
- ruby laser, continuously operating 3=14800
- ruby, laser emission study 3=14336
- ruby laser emissions, spectroscopy 3=14335
- ruby, laser, toroidal, advantages 3=14807
- ruby, luminescence excited by fast electrons and u.v. light 3=4991
- ruby, luminescence transitions, energy level schemes 3=13201
- ruby, maser, optical, power increase, by resonator modulation 3=17073
- ruby maser, pulsed, oscillation characteristics 3=520
- ruby, optical maser giant pulses prod. 3=9968
- ruby, optical pumping, cooling effect 3=15660
- ruby, optically active, thermal cond. 3=10612
- ruby, R lines, linewidth and temp. shift 3=15690
- ruby, radiationless transitions, theory 3=6646
- ruby, relax. time meas., d.c. magnetiz. technique 3=13306
- ruby spin-lattice relax. theory 3=15952
- ruby, stimulated and fluorescent emission (4-300°K) 3=2143
- ruby, symmetry considerations in spectrum 3=13183
- ruby, synthetic, Cr distribution, by X-ray microanalysis 3=8808
- ruby, thermoluminescence, γ -irrad 3=23128
- ruby, ⁴A₂ → ²F₁ transition, identification of components 3=3015
- ruby, Al nuclear quadrupole interaction 3=13317
- ruby, Al²⁷ n.m.r., elec. induced 3=15962
- ruby, Cr³⁺, g-factor variations and crystal field splitting rel. to applied elec. fld. 3=23199
- ruby, Cr ion pairs e.s.r., exchange interactions 3=3167
- ruby, Cr³⁺ radiationless transitions 3=15456
- ruby, Cr³⁺ spin-lattice relax. time, 9kMc/s 3=13298
- sapphire, dissipation factor anomaly 3=15612
- sapphire, friction and wear on steel, erratum 3=11191
- sapphire, Kapitza resistance, 1.3-2°K 3=311
- sapphire rods, bending strength, effect of flame polishing 3=8780
- sapphire, synthetic, refr. index and dispersion 3=2992
- sapphire, synthetic, 27° C elastic constants 3=11131
- sapphire, white, u.v. transparency, linear temp. dependence 3=18010
- sapphire, Ni²⁺ paramag. res. absorption 3=1187
- silica-alumina, i.r. study of surface 3=11313
- 13Al₂O₃·6SO₃·xH₂O, crystal structure 3=13469
- zeolite, n.m.r. of water, calc. 3=11126
- zeolites, n.m.r. 3=23262
- Al alloy 24S-T, fatigue and impact fractures 3=3244
- Al alloys containing intermetallic cpds., plastic deform. 3=20707
- Al alloys damage by electron-irrad., low-temp. 3=22860
- Al alloys, fatigue behaviour, low-cycle 3=20753
- Al alloys, fatigue, data from effects of humidity 3=20751
- Al alloys, fatigued, microstruct. changes 3=20741
- Al alloys, swelling after α -ray irradi. 3=4896
- Al black, thermal props. 3=23369
- Alclad 2024 alloy, fatigue tests 3=7261
- Al oxide, anodic deposit on Al 3=6918
- Al oxide films, negative resistance 3=20321
- Al-20% Ag, heterogeneous precipitation 3=18356
- Al-Ag films, stacking of layers 3=25803
- AlAgCu alloy, growth 3=23394
- Al-Ag, formation of Guinier-Preston zones 3=11284
- Al-Ag, nearest neighbour interact. energy 3=8886

Aluminium compounds — contd

- Al-Ag, spherical segregation zones 3=8875
 Al-Ag (25%) alloys, films, structure, by electron diffr. 3=6884
 Al-Ag(25%) films, structure 3=16110
 Al-Ag, residual elec. resistance 3=25321
 Al-Ag, with ppt. particles, plastic deformation 3=3222
 Al-Ag, zone-hardened, elec. resistivity 3=10717
 Al-Al₂O₃-Sn junctions, superconducting tunneling currents, zero voltage 3=21660
 AlAs diamagnetic susceptibility 3=18058
 AlAu, electronic spectrum of molecule 3=10505
 AlBr₃, Raman spectra of solid and liq. 3=8591
 Al₄C₃, X-ray diffr. pattern 3=23445
 Al-clad Pb wire, superconductivity 3=9682
 AlCl₃, Raman spectra of solid and liq. 3=8591
 AlCl₃ in SnCl₂, Raman spectra, 0.11-0.73 mole per mole 3=14170
 Al-Cu, age hardening, effect of impurities and reversion treatment 3=3332
 Al (50 wt%)-Cu, alloy film, transformation; electron microscope study 3=443
 Al-Cu alloys, liquid, 1000°C, Cu activity 3=14152
 Al-Cu alloys, characteristic electron-energy losses 3=6508
 Al-Cu, clustering, plastic deform. effect 3=18182
 Al-Cu, disloc. interact. with θ' precipitates 3=12977
 Al-(4%)Cu, dislocation-decomposition product interaction 3=23305
 Al-Cu, fatigue behaviour at various compositions 3=25611
 Al-Cu, fatigue, dislocation processes 3=25610
 Al-Cu, Guinier-Preston zones 3=8876
 Al-Cu, planar segregation zones 3=8875
 Al-(1.6 wt.%)Cu precipitation rel. to dislocations 3=20894
 Al-Cu, quench age hardening, impurity effects 3=6796
 Al-Cu, recrystallization, effect of dispersed second phase 3=25757
 Al-Cu solid solutions, matrix block struct. changes 3=20906
 Al-Cu, with ppt. particles, plastic deformation 3=3222
 Al-Cu-U fission fragment damage 3=22855
 AlF mol., singlet electronic states 3=25090
 AlF, spectrum microwave 3=19973
 AlF₄, i.r. absorption spectrum of vapour 3=22553
 Al-Fe films, evaporated, mag. anisotropy and Al source position 3=18084
 Al-In superconducting films, crit. temp. increase on exposure to water vapour 3=19107
 AlLaO₃, fluorescence, colour centres 3=15870
 AlLaO₃, luminescence, perovskite, doped with various Cr concs. down to 4%K 3=15702
 Al-Mg alloy, creep, fatigue activated, 120°-170°C 3=13365
 Al-Mg alloy, dislocation sources 3=17742
 Al-Mg alloys, dislocation "climb" source 3=22785
 Al-Mg alloys, plastic deformation, during creep 3=3226
 Al-Mg alloys, plastic flow, discontinuous, mechanism 3=25634-5
 Al-Mg dil. alloys, quenched-in in vacancies 3=22745
 Al-Mg dil. alloys, quenched-in vacancies 3=22745
 Al-Mg dil. alloys, vacancy-impurity interaction 3=22746
 Al-Mg, discontinuous plastic flow, mechanism 3=13369
 Al-Mg, dislocation sources 3=12974
 Al-Mg, secondary electron emission, rare-earth content effects 3=24342
 Al-Mg-Si, sheet, recryst., effect of heat treatment 3=6869
 Al-Mg, spectrochemical analysis, effect of Si, Zn. 3=25846
 Al-1% Mg, {012} disloc. loops analysis 3=17721
 Al-1% Mg, vacancy loops diffraction anal. 3=22752
 Al-5% Mg alloy, vacancy climb rel. to solute atoms 3=22748
 Al-(7%)Mg-(0.015%)Si, precipitation of Mg₂Si rel. to prismatic dislocation loops 3=10666
 Al_{0.69}Mn_{1.11}, lattice parameters, Mn mag. moments, from X-ray and neutron diffr. data 3=25737
 Al-Mo, growth rate on Mo from Al solns. in liq. metals 3=3344
 AlN, cathodoluminescence 3=13213
 AlN, dislocations and wide stacking faults 3=4874
 β -AlNi, faults, rel. to cold-working 3=12988

Aluminium compounds — contd

- AlN, films, 1-10 μ from chloride, in electrical discharge in N₂ 3=13565
 AlN, spiral growth, and polytypical investigations 3=18255
 AlN, whiskers growth 3=8812
 AlNi, magnets, structural constituents, by microsonde and microhardness 3=16090
 AlO emission spectrum, Al-oxygen flame 3=10504
 AlO, spectrum, bands, visible 3=25089
 AlO₂, thermal cond., doped with mag. impurities 3=2742
 Al₂O₃-AlN, luminescence and phase obs. 3=10985
 Al₂O₃, α -phase, thermoluminesc. after γ -irrad. 3=3072
 Al₂O₃-CaO slags, viscosity 3=5424
 Al₂O₃, catalytic action on adsorbed methanol and ethanol 3=3362
 Al₂O₃, charging by rubbing with Ta wire 3=2966
 Al₂O₃, corundum, Fe³⁺ ion transition matrix elements, calc. 3=23230
 Al₂O₃ (corundum), e.p.r. of V³⁺ ions, hyperfine transitions, calc., temp. effects 3=20659
 Al₂O₃, Cr³⁺ e.s.r. 3=23225
 Al₂O₃: Cr, luminescence, dimers and polymers, var. with Cr conc., reabsorpt. 3=20510
 Al₂O₃, creep, boundary-diffusion controlled 3=15997
 Al₂O₃, doped, microwave u.s. spin-phonon interactions 3=23242
 Al₂O₃, elec. conductivity of single crystals and high temp. 3=15610
 Al₂O₃, electron emission from Al-Al₂O₃-Au 3=4177
 Al₂O₃, energy loss of 4-30 keV H⁺ and He⁺ 3=4394
 α -Al₂O₃, enthalpy 3=25198
 Al₂O₃, e.p.r. of Fe³⁺, 2-80°K, 3 cm 3=20649
 Al₂O₃, e.s.r. of Cr³⁺, linear elec. shifts 3=25568
 Al₂O₃, e.s.r. of Cr₂O₃ 3=13297
 Al₂O₃ films, current flow, mechanism 3=22976
 Al₂O₃ films, preparation 3=5147
 Al₂O₃, fracture strength 3=23351
 α -Al₂O₃, γ -irrad., thermoluminescence 3=23129
 Al₂O₃, Gr³⁺ e.s.r., matrix elements, calc. 3=3165
 Al₂O₃, growth of spirals on Al during electro-polishing 3=1261
 Al₂O₃, hydrated, dielec. props. 100 c/s-100 kc/s 3=4938
 Al₂O₃ layers, fluorescein-activated, luminesc. 3=3036
 Al₂O₃.MgO crystals, transition metal impurity ion energy spectrum calc. 3=20130
 Al₂O₃, Ni ion e.s.r. 3=23232
 Al₂O₃, on thin Al films, negative resistance coeffs. 3=4906
 Al₂O₃, positronium formation and dynamics 3=25264
 Al₂O₃ powders, thermal cond. meas. 3=21584
 Al₂O₃, resistivity, rel. to creep 3=17868
 Al₂O₃, sandwiched between Pb, Schottky electron field emission 3=9828
 α , γ -Al₂O₃, semicond. props. 3=6491
 γ -Al₂O₃, sorbed H₂O dielectric relax. and resonance phenomena 3=22975
 Al₂O₃. spin-lattice relax. of Cr³⁺, effect of V³⁺ 3=15953
 Al₂O₃, thermal diffusivity 3=14296
 Al₂O₃, thermal etched, secondary electron emission 3=9845
 Al₂O₃ thin films, dielectric constant 3=8555
 Al₂O₃, u.v. luminesc. during electrolytic form. 3=8615
 Al₂O₃, with 1 wt.%Zr. dislocations after annealing 3=12976
 Al₄O₄C, crystal structure 3=11268
 Al₄O₄C, X-ray diffr. pattern 3=23445
 AlP, electron transfer 3=20044
 AlP, valence band, l.c.b.o. method 3=779
 Al-Re phase diagram, new phase ReAl₄ 3=20882
 Al (36.5-99.92 at.%)—Rh, crystal lattice spacings 3=18339
 Al-rich alloys, Guinier-Preston zone formation 3=8910
 AlSb, atomic heat, 12-273°K 3=12928
 AlSb diamagnetic susceptibility 3=18058
 AlSb—GaSb, conductivity and Hall effect 3=25352
 AlSb, interband Faraday effect 3=8586
 AlSb, internal force consts. calc. 3=10580
 AlSb, i.r. Faraday effect meas. 3=10816
 AlSb, valence band structure, model 3=2753
 AlSb, Ta doping and high resistivity 3=13068
 Al-Si, ageing, effect of Mg 3=18355

Aluminium compounds — contd

- Al—Si, precipitation rel. to mech. props. 3=13538
- Al—Si solid solutions, matrix block struct. changes 3=20906
- Al—Sn dilute alloys, Sn—vacancy interactions 3=22744
- Al₂(SO₄)₃.K₂SO₄.24H₂O, crystal growth, ultrasonic accel. 3=25668
- Al—Tc phase diagram 3=20882
- Al—Tc system, structure detcs. 3=13520
- Al₂U, n.m.r. of Al²⁷, Knight shift 3=3192
- Al—Zn, ageing, n.m.r. study 3=11295
- Al—Zn alloy, G.P. zones 3=20865
- Al—Zn alloy, Mg atom—vacancy interact. 3=20167
- Al—Zn, formation of Guinier—Preston zones 3=11284
- Al—Zn, Guinier—Preston zones, meas. 3=8881
- Al—Zn—Mg alloy, G.P. zones 3=20865
- Al—Zn, Mg atom—vacancy interaction 3=20167
- Al—Zn—Mn alloy, ageing sequence, 100°C 3=13542
- Al—Zn, nearest neighbour interact. energy 3=8886
- Al—10%Zn, pre-pptn. rate, plastic deform. effect 3=20896
- Al—Zn, residual elec. resistance 3=25321
- Al—Zn, spherical segregation zones 3=8875
- Al—Zn, with ppt. particles, plastic deformation 3=3222
- Al—Zn, zone-hardened, elec. resistivity 3=10717
- Al—30% Zn, spherical pre-pptn. zones 3=8911
- 1.71 Al₂O₃.SiO₂, mullite, crystal structure 3=20857
- 13Al₂O₃.Na₂O.8SeO₃.xH₂O, crystal structure 3=13468

Americium

No entries this year

Americium compounds

No entries this year

Ammonia

See Nitrogen compounds.

Amorphous state

- See also Vitreous state.
- electron-diffraction measurements, background correction method 3=20952
- polymers, temporarily cross linked, viscoelasticity theory 3=11309
- quartz, structural changes on heating in H₂ 3=20917
- X-ray scattering, low angle, large incident beam 3=21446
- Bi, films, electron diffr. exam. 3=16123
- Ga₂Se₃, films, electron diffr. exam. 3=20915
- Ga₂Te₃, films, electron diffr. exam. 3=20915
- In₂Se₃, films, electron diffr. exam. 3=20915
- In₂Te₃, films, electron diffr. exam. 3=20915
- S—P₄S₁₀ solid solutions, effect of P on S chain stabilization 3=20916
- Sb₂Se₃, films, electron diffr. exam. 3=20915
- Sb₂Te₃, films, electron diffr. exam. 3=20915
- Te alloys, metastable phases 3=20877

Amplifiers

- a.g.c., to correct for light source variations in spectrofluorometers 3=5605
- broad-band parametric, exptl. information 3=1908
- for counter, semiconductor, transistor 3=12048
- current-sensitive, for nuc. pulses 3=3982
- d.c., for 10⁻⁹–10⁻¹² A range 3=3978
- dielectric filament with fluorescence 3=17071
- ferromagnetic, parallel-pumped 3=490
- galvanomagnetic d.c. amplifier 3=3977
- information efficiency, by quantum statist. 3=484
- laser, forward and backward wave, max. gain 3=22019
- laser, nonlinear gain characteristics 3=22018
- linear, quantum noise derivation 3=5837
- logarithmic, solid-state 3=24167
- low noise ballistic impulse type 3=14635
- low noise, quantum effects 3=5839
- magnetic modulators of even harmonic type 3=4247
- magnetic, transistorized, for continuous currents 3=24164
- magneto-optical double resonance meas., low-drift d.c. 3=5533
- maser, ruby and ammonia 3=5892
- metal-interface, expts. and theory 3=888
- noise reduction, in mag. balance circuit 3=5608
- parametric, as first stage of mag. res.
- parametric, L-band, He-cooled 3=24462

Amplifiers — contd

- parametric processes, quantum fluctuations and noise 3=4264
- parametric, radio astronomy, 1370 Mc/s, test 3=18649
- parametric, for radioastron. 21 cm H line meas. 3=7044
- parametric, using corundum 3=13230
- photometric precise meas. 3=3862
- for photovoltaic cells, transistor 3=19134
- pulse, transistorized, fast 3=21685
- radioastronomy meas., low-noise, usefulness 3=5840
- semiconductor, low-noise 3=5841
- student lab. instrument 3=346
- for superconducting cryotron, crossed-film, obs., low noise, valve 3=21671
- transistor, high input resistance 3=14482
- travelling wave, mechanical analogue demonstration 3=21191
- tunnel diode, low-noise, microwave 3=6610
- Ge—Al—Al₂O₃—Au, meas. 3=888

Analogue computers

See Calculating apparatus, analogue apparatus.

Anelasticity

See Internal friction.

Anemometers

- electronic 3=16641
- Ling hot film, use in liquid turbulence meas. 3=3790
- for liquid local vels. meas. 14090
- turbulence meas., hot wire, review 3=18840
- turbulent meas., streamwise and cross-stream, hot wire 3=14196

Angle measurement

See also Alignment.

- alignment, optical systems, by elastic deform., to 0.01" 3=21523
- goniometer, three-circle, for diffraction meas. 3=1277
- interferometer 3=24046

Angular velocity measurement

See also Stroboscopes.

- gyrotron, principles 3=5402
- instantaneous speeds of rotation, measuring method 3=9402
- using masers, optical, ring, travelling-wave 3=9401
- stroboscopic tachometer for strobe photography 3=3905

Annealing

See Heat treatment.

Annihilation of electrons

See Electron pairs.

Antennae

See Electromagnetic waves, radiators.

Antiferromagnetic resonance

No entries this year

Antiferromagnetism

See also Magnetic properties, antiferromagnetic.

- crystals, symmetry considerations 3=13233
- paramagnetic suscept. of system, calc. 3=20562

Antiferromagnetic resonance

- absorption linewidth near Néel point 3=8704
- biquadratic exchange in spin Hamiltonian and reduced order 3=20628
- canted systems 3=15914
- high-field expts, 35–70 kMc/s 3=1158
- line width and relaxation, main mechanisms 3=3154
- line width; relaxation of uniform precession 3=3161
- Nagamiya—Keffer—Kittel theory reformulation 3=984–5
- powders 3=23217
- quantum statistical theory at high temps. 3=23214
- spin-wave instability and premature saturation 3=11108
- spin-wave instability and premature saturation 3=20637
- CoCl₂, relaxation 3=5034
- CoCl₂.6H₂O, 9.5 to 47 kMc/S 3=1176
- CoF₂, far i.r. 3=15930
- Cr₂O₃, fine grains 3=23218
- Cr₂O₃, high-field meas. 3=11107
- CuCl₂.2H₂O, at liq. He temp. 3=15929
- F¹⁹ in MnF₂, hyperfine coupling variation, rel. to electric field 3=23199
- KMnF₃, Mn⁵⁵ spin heating, and cooling, 4.2°, 2.2° and 1.8°K 3=1198
- KMnF₃, rel. to Mn⁵⁵ n.m.r. 3=15966
- KNiF₃, far i.r. 3=15930
- LiCuCl₂.2H₂O, at liq. He temp. 3=15929

Antiferromagnetic resonance — contd

- Mn⁵⁵ in KMnF₃, antiferromag.—nuclear double resonance 3=25582
- MnO, far i.r. meas. 3=8703
- NiF₂, far i.r. 3=15930
- NiO, far i.r. meas. 3=8703
- RbMnF₂ 3=3144
- RbMnF₃, cubic phase 3=15928
- RbMnF₃, flopped-spin state, field-independent longitudinal 3=18123

Antiferromagnetism

- See also Magnetic properties, antiferromagnetic.
- adiabatic magnetization, cooling effect 3=15909
- anisotropy const., calc. for strong anisotropy 3=8658
- anisotropy near transition point, short-range order effect 3=5008
- anomalies, biquadratic exchange in spin Hamiltonian explanation 3=20628
- antiferromag. subs., neutron scatt. 3=3121
- antiferromagnets, galvano- and thermomagnetic effects 3=15529
- canting, resonances and h.f. suscept. 3=15914
- conference, Leningrad (1961) 3=3086
- crystal lattice statistics, 7 models 3=12910
- crystallographic point groups and macroscopic symmetry in space—time 3=23366
- crystals, symmetry considerations 3=13233
- cubic, static magnetoelastic coupling analysis 3=6701
- d-bands, exchange narrowing theory 3=11102
- domains, rel. to magnetoelec. effects 3=834
- domains, visual obs. using gyrotropic birefringence 3=14713
- Dzialoshinski—Moriya interactions near defects 3=15729
- e.m. oscillations, dispersion and attenuation 3=25549
- in f.c.c. lattice, by spin-wave method 3=5030
- f.c.c. lattice, Ising, ordering theory 3=8649
- ferromagnetism, weak, in antiferromagnetic crystals 3=6728
- ground state energy, theory 3=25548
- Heisenberg model, high-temp. staggered suscept. 3=20624
- Heisenberg, Padé approximants, application 3=25516
- helical structures, relaxation processes 3=18106
- insulators, indirect exchange between electrons 3=5003
- interacting spins, ground state Hamiltonian 3=11044
- layer structure, by Green function techniques 3=20625
- linear antiferro. chain, theory 3=3148
- linear chain, spin-wave spectrum 3=6730
- linear spin chain with exchange interact. 3=11040
- longitudinal mag. by transverse circ. polarized field 3=6731
- mag. specific heat, rel. to susceptibility 3=3142
- magnetic energy absorption, uniaxial crystal 3=25551
- magnetoelectric effects, spin—orbit statistical theory 3=4900
- magnon renormalization near transition temp. 3=15751
- metals, mag. ground state, transitions theory 3=3094
- metals, transition to ferromag., collective-electron treatment 3=13227
- modern theory, review 3=6697
- n.m.r., theory for large nuclei concn. 3=8726
- nuclear mag. relax. near Curie temp., theory 3=23267
- neutron scatt., slow, polarization effects 3=15861
- neutron scattering in uniaxial antiferromagnetics 3=3149
- nuclear spin—lattice relaxation 3=18137
- phonon—magnon interaction, theory 3=13285
- point defects and their effect on antiferromag. props. 3=15483
- quantum statistical mechanics 3=5027
- quantum statistical mechanics 3=8693
- review of Soviet work since 1958 3=1135
- in semiconductors, crystallochemical model 3=20565
- spin chains, nonuniform 3=25550
- spin configurations coupling by anisotropy 3=3091
- spin-density-wave mechanism 3=15903
- spin ordering theory, based on collective electron model 3=25517
- spin—spin interaction via phonon field 3=23192
- spin wave dispersion, superstructural anisotropy 3=15902
- spin wave theory of b.c.c. lattice 3=1156

Antiferromagnetism — contd

- spin wave theory of planar structures 3=25515
- spin waves with ferromag. double planes 3=23194
- spin waves in metamag. crystals, theory 3=13280
- spinels, "normal", theory 3=1017
- spins, collective motions; spin-wave freq. rel. to temp. 3=984-5
- statistical theory and short-range order 3=18108
- substructures in b.c.c., mol. field treatment 3=20621
- superconductivity, BCS electron pairs 3=9681
- superconductivity, possibility 3=16857
- theory based on Green's functions 3=15767
- thermodynamics props., spin wave theory 3=3143
- transition to ferromag. structure, critical field 3=25499
- Cr—Mn(15%), neutron diffr., superlattice peak 3=18110
- Fe, exchange integral sign change 3=980
- Fe—Mn alloys, f.c.c. and h.c.p., rel. to Mossbauer effect 3=15907

Antimony

- abrasive wear, effect of brittle fracture 3=13386
- atom, analytical wave functions 3=25051
- atomic mass of Sb^{121,123} and neutron separation energies 3=714
- crystal growth, oriented single-crystal square-sectioned rods 3=3264
- crystallization from melt, elastic vibr. effect 3=18248
- cyclotron reson. and electron Fermi surface 3=4851
- de Haas—van Alphen effect 3=18059
- de Haas—van Alphen oscillations 3=4818
- diffusion, in Al, under elec. field 3=22830
- diffusion in SiO₂ 3=25294
- diffusion on Ge surface, 250-650°C 3=20223
- electric field gradient calc. 3=8332
- films, internal stress, elec. cond. 3=20701
- films, on Sb cleavage faces by thermal evaporation Ion, structure 3=16136
- films, transverse electric field effects 3=15541
- i.r. absorptance and elec. carriers 3=4970
- impurity in Ge, Lyman series, chemical splitting 3=939
- isotopes, mass spectra 3=8215
- liquid, density rel. to temp., and m. pt. 3=3793
- magnetoelec. effects and band structure 3=8513
- magnetoresistance, $E_k/H_k = \text{Const. at } 4.2^\circ\text{K}$, exptl confirmation 3=6563
- magnetoresistance, nonohmic, low temp., thermal origin 3=8512
- microhardness decrease, rel. to i.r. irradi. 3=18218
- molten, elec. resist. and Hall effect 3=9475
- neutron coherent-scatt. amplitude 3=25201
- nuclear quad. interaction of Sb^{121,123} 3=8746
- phase transitions, up to 70 kbar 3=19067
- reflectivity and transmission, vacuum u.v., 6-30 eV 3=13145
- solid solubility in Ge, saturation diffusion expt. 3=3342
- specific heat, 20-700°C 3=22659
- u.s. attenuation in mag. field, geometric reson. 3=4817
- in Bi, effect on phase transformations 3=25751

Antimony compounds

- Sb—Bi, crystallization of supercooled alloy system 3=21624
- Sb—Bi scattering time at low-temp. 3=10809
- SbBr, spectrum, emission, vibr. analysis 3=22539
- SbBr₃, melting and polymorphism 3=23371
- SbBr₃, vapour pressure, heat of vapourization, bond energy 3=21629
- SbCl₃, melting and polymorphism 3=23371
- SbCl₃, bond length differences, theory 3=10497
- SbH₃, Urey—Bradley force field 3=22552
- SbI₃, vapour pressure, heat of vapourization, bond energy 3=21629
- Sb₂S₃—Bi₂S₃, photovoltaic e.m.f.'s, 20-30 V/cm 3=15629
- Sb₂S₃, photocond. kinetics, -100° to +100°C 3=20398
- Sb₂S₃, photoconductivity kinetics at room temp. 3=6627
- Sb₂S₃, photovoltaic e.m.f.'s, 20-30 V/cm 3=15629
- Sb₂S₃—Sb₂Se₃, photovoltaic e.m.f.'s, 20-30 V/cm 3=15629
- Sb₂S₃—Sb₂Te₃, elec. and optical props. 3=15585
- Sb₂S₃, secondary electron emission 3=14636
- Sb₂S₃, stibnite, nuclear quadrupole resonance 3=11128
- Sb₂Se₃, films, amorphous structure 3=20915
- Sb₂Se₃, photovoltaic e.m.f.'s, 50-80 V/cm 3=15629

Antimony compounds — contd

- Sb₂Se₃, secondary electron emission 3=14636
- SbSI, absorpt. edge shift in elec. field 3=20468
- Sb—Te, solid solubility rel. to composition 3=3343
- Sb₂Te₃—Bi₂Te₃ with added Te and Se, thermoelectric props. 3=913
- Sb₂Te₃, films, amorphous structure 3=20915
- Sb₂Te₃, films, elec. and thermoelec. props. 3=8514
- Sb₂Te₃, secondary electron emission 3=14636
- Sb₂Te₃, thermodynamic props., 380–420°K, ΔZ , ΔS , ΔH 3=22657
- 2Sb₂S₃.Bi₂S₃, photovoltaic e.m.f.'s, 20–30 V/cm 3=15629

Antineutrinos

See Neutrinos and antineutrinos.

Antineutrons

See Neutrons and antineutrons.

Antinucleons

See Nucleons and antinucleons.

Antiprotons

See Protons and antiprotons.

Apparatus

See Cosmic rays, apparatus; Instruments; Ionosphere measuring apparatus; Laboratory apparatus and technique; Radioactivity measurement, apparatus; Vacuum apparatus; X-ray crystallography, apparatus. Further entries describing apparatus for specific purposes are included under the headings of the appropriate subjects.

Architectural acoustics

See also Echo; Noise abatement; Reverberation; Transmission, acoustic waves.

- artificial harbour design 3=18953
- auditoria reflection patterns, speech intelligibility 3=23990
- concert halls, panel arrays, reflectivity 3=16722
- design, role of acoustics 3=16712
- Deutsche Oper, Berlin, reconstructed 3=7299
- effect of sound absorption in air, review 3=14302
- frequency responses in rooms, correl. functions 3=5506
- leaded building materials, transmission loss 3=18951
- marking of part of sound field by remainder 3=18949
- masking, backward, by white noise pulses, imaginary sources 3=18950
- measurement, correlation, rooms, simple 3=18947
- musical—acoustic common vocab. 3=14301
- New York Philharmonic Hall 3=14294–5
- organ recital halls, variable acoustics 3=9571
- partitions, transmission losses 3=18954
- Philharmonic Hall, New York City 3=14303
- Philharmonic Hall, New York, discontinuous ceilings, reflective properties 3=23991
- porous absorbers 3=9572
- quality, of halls, from echo separation 3=14293
- radiation efficiencies of gypsum, concrete panels 3=7300
- reflection pattern synthesis in anechoic rooms 3=18949
- school acoustics 3=14296
- school auditorium 3=14299
- school classrooms, modern 3=14298
- school music departments 3=14300
- schools, effects of changes in usage 3=14297
- soundproofing structures, transmission loss 3=18952
- windows, response to random noise 3=16721

Arcs, electric

- a.c., cathode spot current density 3=24253
- a.c., reignition in transverse mag. fields 3=4079
- air, d.c., rel. to pressure 3=16922
- air or N₂, free-burning, voltage gradient 3=4072
- arc heater, temp. distrib. of electrode 3=24087
- arc ignition, U₃O₈ → UO₂ transform., solid soln. formation 3=25765
- axial in reflex discharge at very low press., support and confinement 3=7481
- cathode emission mechanisms, high current, pres. 3=9755
- cathode spot and ball-of-fire, motion in mag. field 3=376
- cathode spots, hybrid 3=4070
- cold cathode, theories for current densities 3=4081
- collisionless plasma-sheath transition 3=5644
- cylindrical, approx. calc., considering radiation 3=4073
- e.m. radiator, plasma-metal, cathode spot, switch, high speed 3=14766

Arcs, electric — contd

- electrode material emission mechanism, rel. to spectroscopic analysis 3=24252
- Elenbaas—Heller equation solution 3=21753
- formation in vacuum 3=19222
- globular, mechanism 3=24254
- heating, sample in electrode, chemical reaction effects 3=24257
- high-current filamentary discharge with point electrodes 3=374
- high-current, radial potential distrib., expt. and theory 3=4084
- high-intensity, resistance meas. method 3=375
- high power, cascade, improvement 3=21751
- hollow cathode, characteristics meas. 3=21773
- ignition with gas flow 3=4080
- impurities, effect on ionization potential and temp. 3=12096
- inert gases, heavy, high-pressure radiative function 3=14555
- inert gases, temp. and thermal equil. 3=1953
- initiation study by microwave meas. on plasma 3=5645
- ion emission, high energy 3=14662
- ionization potential, dependence on easily ionized impurities, conc. 3=19224
- jet, gas, temp. equilib. meas., spectral 3=21754
- light source, u.v., l.p., all-metal 3=21533
- in liq. hydrocarbons, temp. detm., rel. to acetylene formation 3=7484
- low- and high-pressure, similarities, for high current densities 3=7489
- magnetic annular arc 3=1954
- mercury arc, low-pres., limiting current 3=7487
- model theory, general, and Steenbeck's minimum principle 3=4074
- in nozzle under forced convection, theory 3=7485
- plasma, electrode substance, equil. concn. 3=1952
- plasma flame jet, temp. meas., in terms of Fe spectrum 3=16921
- plasma generator, jet, structure 3=9809
- plasma jet, for spectroscopic source 3=1820
- positive column, deflection 3=21777
- progress, review 3=7482
- rectifiers, arc-back rel. to ion density, inverse field 3=4083
- resistance, variable, for generation, up to 400 A d.c. 3=9694
- sources of H₂⁺ ions up to 200 keV 3=24377
- space charge sheath, positive column 3=4057
- spectrochemical analysis, rare earth, atlas. 3=25854
- spectrochemical analysis, S, Se, Te, impurity effects. 3=25847
- spectroscopic light source, high-voltage with perforated anode 3=19000
- stabilization by mag. field 3=407–9
- switch, Hg pool cathode with gas filling 3=4082
- temperature, axial, of cylindrical arcs with strong radiation 3=7488
- temperature meas. 3=16920
- temperature meas. along axis of arc jet 3=24258
- temperature meas., using shock waves and spectroscopy 3=19225
- torch arc in air 3=16919
- vacuum C arc, mag. confined, temp. det. 3=19930
- vacuum u.v. light source 3=7349
- water-stabilized, ion density, temp. det. 3=21752
- Ar, cascade, vacuum-u.v. spectral intensity definition 3=4076
- Ar, cold-cathode characteristics, at pulsed-current loading 3=4077
- Ar, column, local elec. characteristics 3=14558
- Ar, column, radius and radial distrib. 3=14559
- Ar, d.c., rel. to pressure 3=16922
- Ar, elec. characteristics 3=4071
- Ar electron densities and arc temps. 3=24260
- Ar, high-intensity, anode heat transfer 3=7483
- Ar, high pressure, emission 3=8180
- Ar, low-pres., optical radiation phenom. 3=4078
- in Ar, Mo cathode, plasma flame jet, temp. meas. 3=16921
- Ar, pseudo-high-energy positive ions 3=7518

Arcs, electric — contd

- Ar, radial temp. 3=16917
- Ar, 740 torr, radiative function 3=14555
- Ar, shock-heated, impedance of cold electrodes 3=21755
- Ar-He jet for spectroscopic excitation source 3=24259
- B volatilization, d.c. 3=19220
- C arc, 194 inch, high current, mag. confined 3=14556
- C in air, magnetic contraction at medium current intensities 3=7486
- C, spectra, metallic impurity effects, ionization potential 3=19224
- C, spectral meas., visible and i.r., as radiation standard 3=21539
- C, stabilized by Na, radial temp. distrib. 3=24261
- C, temperature meas. using shock waves and spectroscopy 3=19225
- Cu, transport, compared with Na 3=24256
- Cu-base alloy, from electrodes 3=24255
- d.c., high-pressure investig. 3=24250
- d.c., silent and hissing 3=16918
- H, whirl-stabilized 3=4075
- He II spectral line broadening, exptl. contrib. to theory 3=4069
- Hg, low-pressure, gas-density reduction near current limit 3=4067
- Hg, low-pressure, limiting current rel. to azim. mag. field 3=4068
- Hg, low-pressure, as u.v. source 3=14329
- Hg, low-pressure valve, optical radiation quenching effect 3=19223
- Hg, temp. meas., by line self reversal 3=21595
- K, lines, excitation cross-sections 3=17533
- Kr, low-pressure, optical radiation phenom. 3=4078
- Kr, 2 atm., radiative function 3=14555
- Mo cathode, in Ar, plasma flame jet, temp. meas. 3=16921
- Mo, hot, exposed to toroidal H discharge, contaminated 3=9756
- N₂, cylind. symm., temp. distrib. and charact. 3=14557
- Na direct current jet, 4982.8 Å line broadening 3=9757
- Na, transport, compared with Cu 3=24256
- Ne, cold-cathode characteristics, at pulsed-current loading 3=4077
- Ne, low-pressure, optical radiation phenom. 3=4078
- O plasma, Stark-broadened spectral lines, shifts and widths 3=24277
- Xe, high-pressure, voltage-current charact. 3=24262
- Xe, low-pressure, optical radiation phenom. 3=4078
- Xe, magnetic contraction, at medium current intensities 3=7486
- Xe, 2 atm., radiative function 3=14555

Area measurement

- beta-ray activity, by luminescence 3=6189
- particles, irregular, various methods 3=1651

Area measurement, porous substances

See Surface measurement

Argon

- absorption coefficients, 600-1025 Å 3=25056
- acoustic radiation pressure, Brouillouin's relationship 3=16657
- adsorption, multilayer, on hexagonal BN 3=6894
- adsorption on graphitized carbon black 3=11324
- arc, cascade, vacuum-u.v. spectral intensity definition 3=4076
- arc, column, local elec. characteristics 3=14558
- arc, column, radius and radial distrib. 3=14559
- arc, d.c., rel. to pressure 3=16922
- arc, elec. cold-cathode characteristics, at pulsed-current loading 3=4077
- arc, elec., low-pressure, optical radiation phenom. 3=4078
- arc, electric, Mo cathode, plasma flame jet, temp. meas. 3=16921
- arc, electric, 740 torr, radiative function 3=14555
- Ar, high-intensity, anode heat-transfer 3=7483
- arc, rel. to C cathode hybrid spots 3=4070
- arcs, elec. characteristics 3=4071
- arcs, electric, radial temp. 3=16917
- atom, absolute oscillator strengths 3=15280
- atom and Ar II, resonance lines 3=14355
- atom, scatt. by Li, interact. potential eval. 3=15305

Argon — contd

- atomic inner shells, excit. and ioniz. by X-rays 3=25058
- atomic transition probabs., meas. in plasma 3=10447
- atoms, electron scattering, elastic and inelastic, 25 keV 3=22495
- atoms and ions, electron ejection from Mo 3=9842
- atoms, in plasma, Stark broadening of isolated lines 3=701
- atoms, two-electron transitions to autoionizing states 3=19927
- boiling and triple points, detm. 3=9659
- breakdown, in external-electrode glass cells at steady alternating pots. 3=4092
- breakdown, low-pressure, short duration times 3=4089
- breakdown, microwave, meas. 3=5648
- breakdown, between plane electrodes, rel. to pressure 3=4091
- C_v meas. near critical pt. 3=1729
- collisions with light element (Z=2 to 18) ions, electron loss 3=7448
- compressibility, quantum hard-sphere model 3=21434
- critical point, cellular method calc. 3=21292
- crystal, elastic relaxation around a vacancy 3=20100
- diffusion of Ar⁴⁰-Ar³⁶ in pure Ar, thermal 3=14203
- diffusion, into H₂, through porous materials, separation 3=9491
- diffusion in K halides, after n irradi. 3=15508
- diffusion of Kr⁸⁵ in dense gas 3=1720
- discharge, electric field distrib. during transition from Townsend to glow 3=24242
- discharge, electric, h.f., 3=19237
- discharge, enhanced diffusion, r.f. with mag. fld. 3=1944
- discharge, glow, atmospheric pressure, Cs, K addition 3=24241
- discharge, noise suppression by applied r.f. energy 3=12091
- discharge, pulsed, light characteristics mag. fld. effects 3=14540
- discharge rel. to air corona 3=4046
- discharge, vacuum u.v. spectra 3=7462
- elec. discharge, positive column in transition region 3=9753
- electric arcs, electron densities and arc temps. 3=24260
- electron diffusion-mobility coeffs. ratio 3=4023
- electron mobilities, cloud chamber meas. 3=23941
- gas, acoustic isotherms 3=16659
- gas, Aston bands, rel. to ionization 3=4020
- gas discharge, pres. grad. in positive column 3=19208
- gas, electron back diffusion in 3=5693
- gas flow, free-molecular, momentum transfer to metal surfaces 3=5456
- gas, ionization by H atoms and protons, 10-180 keV 3=5620
- gas, ionized, rarefied, charge-carrier diffusion 3=16906
- gas, sound velocity and absorption 3=9509
- gas, u.s. vel. meas., 3.5 Mc/s at 3500 atm 3=1728
- gas, velocity of sound 3=5497
- gas, viscosity, - 78.5° to 100°C, below 200 atm 3=7223
- gas, Z-pinch discharge, rel. to pressure 3=9762
- gettering, electrical in low-pressure discharge in steel vessel 3=7461
- glow, admixture rel. to Ne reference tube 3=4054
- glow discharges, electron emission rel. to photons 3=7632
- ion, Ar⁴⁰, charge distrib. at high velocities 3=7447
- ion beam, range in metals from sputtering yield 3=5721
- ion collision data by ion cyclotron reson. 3=21697
- ion emission, field 3=19371
- ion source, low-energy, for small specimens 3=14666
- ionically pumped, re-emission 3=9518
- ionization ahead of cylindrical shock waves 3=1759
- ionization by atoms and charged Ne and Ar ions 3=365
- ionization, Auger effect 3=12069
- ionization coeffs. and uniform field breakdown, for low E/p values 3=4011
- ionization by h.f. pulse, recombination 3=4024
- ionization potential by photoelectron energy spectra 3=7434
- ionization by protons, 0.15-1.1 MeV 3=4006
- ionization, quenching by SF₆, electronegative seeding 3=19237
- ionization, by ruby laser 3=19170
- ions, A⁺, cathode sputtering of 16 metals full-plane threshold energies 3=22875

Argon — contd

- ions, Ar^+ , collisions with Ar at keV energy, inelastic energy loss 3=709
- ions, bombardment effects on Al 3=10706
- ions, energy loss and effective charge in gases at $< 10 \text{ MeV/a.m.u.}$ 3=1937
- ions, forbidden transition probs. calc. 3=25055
- ions (41), range in Al, 0.7 keV-2.25 MeV 3=19372
- ions in lattice focused collision sequences in W, Mo 3=22881
- ions, medium energy, sputtering yield, metals 3=14679
- ions, positive; mobility 3=4021
- ions, range in W, keV energies 3=22878
- ions, scattering, 30 keV, ang. distrib., on graphite, Cu, W 3=5720
- ions, sputtering of KCl, 400 eV 3=4215
- Ions, Ar^+ , 5 mA monoenergetic source 3=12253
- Joshi effect, thermionic analogue 3=21736
- light source lamps, spectra, 230-1200 m μ , effect of structure and excitation 3=16760
- liquid, electron drift velocity 3=21400
- liquid, electron trapping by O_2 and N_2 impurities 3=19175
- liquid, eqn. of state at low temp. 3=18801
- liquid, ions, long-range osc. interactions 3=9439
- liquid mixture with methane, viscosity 3=7185
- liquid, neg. ion mobility in 3=1678
- liquid, scintillation response to protons, 10-50 MeV 3=19635
- liquid systems, binary, with O, N and O 3=132
- liquid, viscosity and mol. interaction 3=9423
- in meteorites, loss, rel. to gravitation interaction decrease 3=11523
- molecular beam scattering on LiF cleavage plane 3=2680
- orthopositronium lifetime 3=2252
- plasma, absorption coeff., continuous, 4000-7000 Å, 8000-24 000 Å 3=1972
- plasma, bumpy torus, afterglow 3=19270
- plasma, deionization in magnetic field 3=19249
- plasma gun 3=19238
- plasma, insulating-boundary thickness behind shocks 3=24456
- plasma jet, elec. and optical studies 3=24276
- plasma jets, subsonic, power dissipation, temp. 3=5663
- plasma, optically thick in red, i.r. 3=16924
- plasma, partition functions, thermodynamic props. 3=21819
- plasma, quenching by SF_6 electronegative seeding 3=19237
- plasma, radiation temperature resonances, r.f. meas. 3=4121
- plasma, temperature, spectroscopic 3=7502
- plasma wrapped round Cu vapour; contraction and emission 3=7557
- positron thermalization in 3=24706
- pot. prod., on 10-25kV X-irradiation, and reson. press. vars. 3=7449
- Rayleigh scatt., depolarization. 3=175
- refractive index, 1600 Å 3=9592
- refractive index, vac. u.v., using Cherenkov radiation 3=14214
- shock waves meas. by microwave techniques 3=9545
- shock waves, normal and oblique, equilb. ionization calcs. 3=23973
- shock waves, rel. to intermol. force laws 3=1755
- solid, compressibility 3=11147
- solid, energy of vacancy formation 3=20163
- solid, equation of state, Lennard-Jones and Devonshire applicability 3=20117
- solid, Grüneisen const., Born's theory 3=25203
- solid, Mn atom absorption spectrum, 4°K 3=23074
- solid, refractive index meas. 3=15647
- solid, thermal expansion, linear chain model 3=17665
- solid, u.v. absorpt. and electron states 3=2998
- solid, vacancy contrib. to spec. heat 3=8364
- solid, vapour snakes 3=11224
- spectrum, continuous, vacuum u.v. 3=7246
- spectrum, emission in high pressure arc plasma 3=8180
- sputtering of Cu, Pb, Al, Zn, 1-2 MeV 3=7656
- sputtering of Cu, rel. to incident angles 3=19374
- striation formation, time parameter characteristic interpretation 3=19194
- thermal conductivity and viscous props. 3=11832

Argon — contd

- triton range, 0.2-2.7 MeV 3=10180
- vacuum pumping, ion, mechanism 3=23946
- velocity, sound, up to 150 atmospheres, 300°C 3=7242
- viscosity meas., oscillating disc. method 3=14189
- viscosity and thermal cond. of mixtures with He and Ne 3=168
- Ar^+ , bombard. of Cu and Ni (100) faces 3=13020
- Ar^+ , formation and stability 3=4004
- Ar^+ sputtering of Cu and Ag, 10-200 keV 3=7655
- Ar^+ sputtering of Cu, 5-20 keV 3=4217
- Ar^+ sputtering of Cu, Ni, Fe, Mo, 100-1000 eV 3=4216
- Ar^+ , sputtering of Cu (100) surface 3=10703
- Ar^+ -ion sputtering of Cu, focused recoil trajectories 3=2049
- Ar^{40} in atmosphere, from K^{40} in earth, and crust development 3=13648
- ArII excitation by H^+ and He^+ 3=12770
- ArII spark spectra in low-press. plasma 3=7609
- Ar II, statistical model, Slater integrals 3=6349
- Ar-Kr, diffusion of Kr^{85} 3=3822
- Ar-Kr, liquefied mixtures, kinematic fluidities 3=1673
- Ar-Ne discharge, pulsed microwave 3=14537
- Ar-Ne discharge in pulsed microwave field, electron density build-up 3=12086
- Ar-Ne mixture, liquid, electron drift velocity 3=21400
- Ar-Ne mixtures, electric strength, for pulsed microwave fields 3=5647
- Hg-Ar, discharge, low-pressure positive column energy balance 3=19218
- N_2 excitation, by metastable Ar, in plasma stream 3=8263
- Argon compounds**
- No entries this year
- Arsenic**
- crystal growth from melt, purification 3=11225
- density meas., m.p. to 1323°K 3=23838
- diffusion in Si, 1100°-1350°C meas. 3=10689
- electric field gradient calc. 3=8332
- films, preparation, structure and electrical properties 3=17875
- magnetoresistance, nonohmic, low-temp., thermal origin 3=8512
- neutron coherent-scatt. amplitude 3=25201
- phase transitions, up to 70 kbar 3=19067
- solid solubility in Ge, saturation diffusion expt. 3=3342
- vaporization from porous solid, Knudsen model 3=24118
- in Zn, radiochemical detm. 3=1399
- Arsenic compounds**
- alloys, superconductivity 3=16873
- sulphoarsenides, polyhedra structure 3=18328
- As(CN), crystal and molecular structure 3=8849
- AsH₃, Urey-Bradley force field 3=22552
- As₂S₃, amorphous films, 3 to 8 μm , I-V characteristics 3=889
- As₂S₃-As₂Se₃-As₂Te₃, vitreous, atomic structure, corrections 3=18363
- As₂Se₃, amorphous, films, structure 3=13461
- As₂Se₃, crystal, unit cell, space group 3=18364
- As₂Se₃, glassy and crystalline states, short-range order 3=10802
- As₂Se₃-type glasses, far i.r. spectra 3=10930-1
- 3As₂Se₃-As₂Te₃, glass, crystallite detection by electrical conductivity 3=8921
- As₂Se₃-As₂Te₃, vitreous, crystalline (low-temp), atomic structure 3=18364
- As₂Te₃, amorphous, films, structure 3=14961
- As₂Te₃, crystal structure 3=13456
- As₂Te₃, crystal structure, atomic 3=18364
- As₂Te₃ + Ti_2Se systems with Sb₂Te₃, Bi₂Te₃, Sb₂Se₃, thermoelec. 3=10893
- As₂S₄, "electron-on-sphere", molecular-orbital model 3=727
- Association**
- butanediol-1,3, rel. to dielec. relax. 3=1704
- 1:1 charge-transfer complexes, consts. det. 3=2674
- Frankel-Band theory 3=12877
- glycerol, rel. to dielec. relax. 3=1704
- hexanetriol 1,2,6, rel. to dielec. relax. 3=1704
- 2-methyl pentanediol 2,4, rel. to dielec. relax. 3=1704
- O₂ on InSb surfaces, rel. to yield drop 3=13353

Association — contd**gases**

- LiBO₂, vaporization, mass-spectrometric study 3=25807
- NaBO₂, vaporization, mass-spectrometric study 3=25807
- S vapour, equilibrium composition 3=25805
- S vapour, partial pressure of S₂ 3=13587

liquids

See also Colloids.

- acridone solns., none detected 3=141
- calc. from ultrasonic props., rel. to other methods 3=1684

Astatine

No entries this year

Astatine compounds

No entries this year

Astronomical instruments

See also Radioastronomy; Telescopes, astronomical.

- Acufine photographic developer 3=5542
- astrophot objective, coma, rel. to star positions on photo. plate 3=3524
- camera, Schmidt, Cambridge, performance, astrometric 3=21082
- camera, Schmidt, plate adjustments, photographic and corrector 3=21081
- chronograph tape control, photoelec. device 3=1909
- coronagraph, scattered light reduction 3=9142
- for coronal monochromatic studies 3=16387
- coronameter, photoelec., automatic 3=9216
- coronagraph, 200/3000/4000, optical system 3=11490
- filter for u.v. solar radiation study 3=1502
- filters, bandwidth, effects on detected energy, stellar obs. 3=18585
- image orthicon, use 3=9144
- image position meas. by polarimetry 3=21572
- meteor cameras, meniscus, Schmidt 3=16319
- microphotometer, intensity recording 3=11485
- modulator for photoelec. polarimeter 3=14378
- monochromator for high order isolation 3=7345
- objective doublet, aplanatic, insensitive to centring 3=18583
- optical system testing, Hartmann modification 3=9580
- photographic films, visible and i.r. sensitivity 3=9631
- photographic plates, sensitization 3=7361
- photography, colour, compensations 3=16314
- photometer, 8-14 μ 3=21080
- photomultipliers, pulse-counting application 3=9146
- photomultipliers, temp. regulation and effects 3=5695
- polarimeter, spectral, solar, 2-4 Gec/s 3=11491
- radiation detectors, far i.r., for planetary obs. 3=16349
- reflectors, large, for astrometry 3=7008
- Schmidt camera for astrometry 3=9149
- solar spectroscopy, rocket-borne 3=11531
- for spectrogram meas., broad line, scanner comparator 3=16315
- spectrographs, effect of resolving power 3=9239
- spectrometer, photoelec. grating 3=9148
- spectrometer, rocket-borne, for 1300-4000 A 3=18584
- spectrometer for solar radiation in far u.v. 3=23682
- spectrometers, concave gratings 3=9147
- spectrophotometer, pulse-counting, dual-channel 3=9145
- spectroscopic sun-tracking head 3=21550
- starlight scintillation, atmosph. turbulence model 3=23653
- telephotometric systems, review 3=23655
- television, closed-circuit, appls., review 3=16313
- tests, Hartmann combined with spot diaphragm 3=11489
- transit circles, thermal and mechanical stability 3=11483
- vacuum u.v. photoionization detector 3=21537

Astronomical observations

See also Radioastronomy.

- astrometry, photographic, long-focus 3=7010
- astrometry, photographic, overlapping plates 3=11484
- astrometry, photographic, sources of error 3=7011
- equivalent widths calc. from spectral-line profiles 3=11482
- from high altitudes 3=1500
- image analyser, direct, for stellar studies 3=7013
- instrument developments, conference 3=9139
- latitude det., Struve method re-eval. 3=16318
- lens image of star, phase information 3=7311

Astronomical observations — contd

- measurements of unit, origin of discrepancies 3=16312
- observatory, Long Island, for solar work 3=7016
- orbiting solar observatory, instruments 3=9286
- panoramic cylindrical projection, use 3=13849
- photographic, systematic accuracy 3=16311
- photometry of very faint stars 3=16317
- polarization meas., errors, telescope effects 3=7015
- polarization meas., instrumental effects 3=7019
- range and velocity, radar meas., effect of earth motion 3=23654
- "seeing", instrumental recording 3=25964
- spectrograph, Newtonian two-prism 3=9153
- spectrophotometric standards 3=16316
- starfield recognition, using television techniques 3=25965
- television, closed-circuit, appls., review 3=16313
- television recording from moving spacecraft 3=7014
- wide scale pairs, theory 3=11486

Astronomical spectra

- See also Atmospheric spectra; Cosmic radiations, radio-frequency; and individual astronomical bodies, e.g. Sun.
- comet Seki (1961f), emission band and continuum photometry 3=3551
- forbidden emission lines, intensity 3=2550
- Fraunhofer lines, Doppler widths, empirical inference 3=9224
- G-stars, spectrophotometric gradient "break" at 4800 A 3=1528
- interstellar band, diffuse, 4430 A 3=9161
- interstellar band, 4430 A, identification 3=9160
- solar disk centre, Fraunhofer line structr. and continuum brightness flucst. 3=3567
- star, late main-sequence, relationship with colour 3=3595
- stars, belnded lines, non-coherent scatt. function 3=1529
- stars u.v. obs. rel. to interstellar radiation field 3=1527
- sun, centre of disk, brightness fluctuations 3=1520
- sun, corona, inner, continuum and 17 emission lines, photometric study 3=3577
- sun, corona, 7800-12 000 A during eclipse Feb. 15, 1961 3=3580
- sun, flare, Nov. 12, 1960, H α line 3=3576
- sun, flares, X-ray, rel. to radio emission 3=3579
- sun, Fraunhofer lines and continuum, brightness fluctuations 3=3565
- sun, line asymmetries 3=3568
- sun, photosphere, spectrogram Doppler displacements, rel. to vertical oscillatory motions 3=3566
- sun, spectrophotometric gradient "break" at 4800A 3=1528
- sun, u.v. radiation, filter for study 3=1502
- sun, YII, calc. growth curve 3=2551
- u.v. and X-ray, by rockets and satellite, U.S. Naval Research Laboratory 3=11481
- H lines, intensities and profiles 3=5280
- P, S, Cl and Ar ions, forbidden transitions 3=25055

Astronomy and astrophysics

See also Cosmology; Radioastronomy.

- accretion equation solution, special case 3=18594
- astrometry, symposium, Aug. 1962, New Haven Connecticut 3=7004
- astronomical unit of length, theory and meas. 3=5229
- Bose gas 3=18590
- conference on observations 1959-60 3=9139
- electron acceleration mechanism, Veksler, inadequacy 3=17361
- evaporation pressure in a radiation beam 3=19062
- of fundamental particles review 3=23652
- γ -ray astronomy, review 3=617
- ionization in cloud of solid particles 3=9731
- optical, future of British research 3=5230
- radiative transfer problems, numerical approximations 3=21266
- representative measurement 3=21079
- Soviet, review 3=21185

Atmosphere

See also Air; Electromagnetic wave propagation, atmosphere; Ionosphere.

- acoustic waves atten., 200-2000 c/s. 3=16232
- atmospheric tracers and general circulation, review 3=23587
- depression centres and jet current wave origins 3=11387

Atmosphere — contd

- electron energy dissipation from vertical incidence 3=23594
- exosphere, density distrib. analysis 3=16239
- fluid, stratified, appl. 3=5405
- homogeneous, height of, from meteor data 3=5220
- horizontal soundings by balloons 3=3450
- impurity distrib., effect of precipitation 3=5193
- infrared cooling meas. using satellite 3=1444
- ionization near ground, fair weather 3=11390
- i.r. flux, upward, observed and computed 3=13678
- i.r. radiation absorption, bibliography 3=9852
- kinetic energy, frictional dissipation 3=16213
- oscillations 3=5200
- radiation, black body, into space, temp. reduction 3=11403
- surface stress determination 3=11396
- tropospheric irregularities, wide-angle radio-wave scattering 3=13721
- turbidity, rel. to global albedo 3=6961
- USA standard atmosphere, 1962, up to 700 km 3=5187
- variations rel. to time and solar activity 3=1426
- vertical sounding techniques 3=3448
- vibrationally excited mols., prod. and effects 3=13786
- Cu—Zn alloys, corrosion, by NH_3 -containing atmosphere 3=8953

composition

- dust, rel. to meteoric influx, zodiacal cloud 3=3469
- extreme u.v. region, 90 km absorption, spectrometric analysis 3=1456
- ground level, N_2O , CH_4 , CO abundances 3=13664
- hydrogen conc., 550, 1000 km, from nightglow, u.v. 3=11481
- ionosphere, protons, charge exchange source 3=16242
- night, grav. separation, mass spectr. meas., 100-210 km. 3=25917
- oxygen, in model, photochem. equil. 3=16208
- ozone 3=13662
- ozone, i.r. obs. of vertical distrib. 3=16207
- ozone, rel. to moon. 3=13661
- ozone, rel. to sunspots 3=13658
- ozone, rel. to time and atmosph. quantities 3=1428
- ozone, stratosphere—troposphere exchange, rel. to global supply 3=6953
- ozone variations and distrib. with height 3=5194
- particle conc. meas., down to 0.001μ 3=18491
- particulate air contaminants, activation analysis 3=9019
- stratosphere, water vapour and CO_2 3=1429
- trace gases, Symposium, Utrecht 1962 3=23601
- upper, O_2 abundance variation 3=1468
- Ar^{40} , from K^{40} in earth, and crust development 3=13648
- CO_2 fluctuations, due to sea property changes. 3=25866
- He atom, metastable 2^3S state, calc. 3=3483
- He^+ , in upper atmos., reactions with O_2 and N_2 3=3482
- I, Br, Cl content. 3=25868
- Li, twilight obs. after nuclear explosion 3=11447
- N atoms, at 100 km, from airglow NO spectra 3=3508
- N oxides and NH_3 trace gases. 3=25870
- N_2^+ , prod. and loss processes 3=13787
- N_2 in upper atmosphere up to 400 km 3=9067
- Na cations, detection method 3=1408
- NO, due to nuclear explosion X-rays 3=11418
- O in polar mesosphere, reactions rel. to temp. 3=9018
- O/O_2 , 100-135 km, by mass spectrometer, rocket-borne 3=18522
- $\text{O}-\text{O}_2-\text{N}_2$ variation, 100-210 km, mass spectr. data 3=3481
- O_3 layer concn. up to 60 km 3=23581
- O_3 and sunspot cycle, comments on Willett 3=13659-60
- SO_4^{2-} aerosols at 20 km, particle size. 3=25871
- T and D content in hydrogen 3=13663
- Xe^{136} content, rel. to solar system chronology 3=9165

humidity

- See also Humidity.
- aerosols, ion equil. and size distrib. 3=11416
- daily variation meas. 3=11392
- above desert, Sahara, total water vapour 3=18493-4
- direct indication for dry and wet bulb temps. 3=9017
- 15-20 km, abundance by microwave obs. 3=9020
- hurricanes, water distribution. 3=25882

Atmosphere — contd

humidity — contd

- indirect probing techniques using radar 3=5188
- measurement, Al_2O_3 element, for radiosondes 3=18490
- moisture profiles, up to 31 km, middle latitudes 3=9021
- profile and eddy flux adjustments 3=21031
- radiosonde, C-type, radiation and lag errors 3=11389
- saturation vapour press. rel. to density, intermolecular attractions 3=18495
- turbulent flux meas., instruments 3=16209
- turbulent pulsations, optical device 3=7253
- wind jets streams 3=21035

ionization

- See Atmospheric electricity; Ionization, atmosphere; Ionosphere.

movements

- See also Wind.

- air currents in meteor zone 3=11520
- baroclinic model, two-layer, stability 3=16212
- barotropic zonal currents, dynamic instability 3=6955
- circulation det. from β -activity in surface air 3=18501
- circulation, from natural radioactivity obs. 3=25909
- circulation, general formulation problem 3=3456
- circulation, general, rel. to tracers data, review 3=23587
- circulation, obs. by radioactive nuclides 3=18499
- circulation, rel. to trace substance movement. 3=25869
- circulation and tides, meas. and theory 3=13697
- clouds, vertical air movements and buoyancy 3=1438
- convection patterns, below small cumuli. 3=25876
- convection, salt-induced, and clouds 3=16218
- cyclone, tropical, vertical and radial motions 3=6956
- diffusion of continental and oceanic masses, low altitude 3=21034
- diffusion of heavy particles, turbulent 3=18496
- diffusion, wind tunnel modelling 3=18500
- dispersion, vertical, from ejected admixture settling 3=9031
- eddy currents, k.e. variations rel. to jet stream 3=9029
- eddy diffusivity, from turbulent energy meas. 3=11395
- eddy fluxes, quasi-horizontal, 25-60 km 3=18497
- electric current, vertical convective 3=5203
- filtered and non-filtered models, baroclinic instab. 3=16211
- global exchange processes, study by natural and artificial tracers. 3=25907
- gravity wave propag., upper boundary condition, including viscosity 3=23582
- gravity waves, as three-dim. problem 3=5196
- horizontal spread, effect of wind shear 3=5197
- hurricane, steady-state, rel. to thermal structure. 3=25881
- hurricanes, water distribution. 3=25882
- ionosphere, due to nuclear explosions 3=3486
- ionosphere, irregularities drift, meas. 3=11425
- jet stability in barotropic fluid 3=16216
- jet stream, eddy kinetic energy distrib., criticism 3=16210
- kinetic energy, frictional dissipation 3=16213
- lower atmos., turbulence broad-band spectral meas. 3=3454
- mixing, large-scale, from CO_2 seasonal and meridional variations. 3=25867
- neutral, turbulence exchange and wind vertical distrib. 3=3459
- numerical prediction models, truncation errors 3=1432
- oscillations excit. by solar radiation on ozone 3=21037
- ozone, stratosphere—troposphere exchange rel. to global supply 3=6953
- particulate matter diffusion, deposition 3=9023
- penetration of interfaces by cylindrical thermals 3=21036
- perturbations, large-scale, generalized soln. 3=18498
- planetary circulation, spectral analysis application 3=25877
- profile and eddy flux adjustments 3=21031
- from radioactive tracers, produced by cosmic rays 3=9022
- radioactive tracing technique, Cu^{64}O 3=18503
- and radioactivity 3=9059
- sound channels 3=23588
- stratosphere, mean meridional circulation 3=5194
- stratosphere, sudden warming, spectral analysis. 3=25875

Atmosphere—contd

movements—contd

- stratosphere—troposphere, discontinuous and radio-activity 3=21032
- stratosphere—troposphere, transport processes 3=6954
- stratospheric wind fluctuation, permanency evidence 3=13666
- stratospheric winds, rel. to geomag. variations 3=5225
- stream function calc. from vertical motion. 3=25879
- surf. layer turbulence, empirical data 3=3455
- surface layer, turbulent fields under diabatic conditions, non-dimensional parameters 3=23586
- terrestrial—ionospheric cavity resonance, rel. to thermonuclear explosion, 9 July 1962 3=3485
- troposphere, transport and large-scale diffusion 3=1431
- troposphere, upper, wind structure 3=16215
- tropospheres, N and S, diffusion barrier existence. 3=25874
- tropospheric, effect of stratosphere temp. changes 3=1430
- tropospheric waves due to nuclear explosion 3=5195
- tropospheric—stratospheric mass exchange 3=21033
- turbulence, band-pass filter recording 3=5603
- turbulence, large-scale, geostrophic kinetic energy spectrum analysis 3=13665
- turbulence model, rel. to starlight scintill. 3=23653
- turbulence, 90-130 km, review 3=13698
- turbulence, noise generation theory. 3=25914
- turbulence, specific features 3=3453
- turbulence, upper 3=11420
- turbulent diffusion, generalized theory 3=9026
- turbulent energy dissipation 3=9030
- upper, due to high altitude nuc. explosion 3=13696
- upper stratosphere, rel. to lower level movements 3=3458
- variations rel. to time & solar activity 3=1426
- vortex patterns, advection in formation 3=6959
- wind shear, rise of isolated thermal 3=5198
- wind, turbulence, effect of temp. field 3=23583
- Rh¹⁰² tracer experiment, high-altitude 3=3457

precipitation

- condensation nucleus concn., rel. to drop sizes 3=18507
- cumulus clouds, model rel. to droptime meas. 3=5201
- effect on radioactivity 3=9054
- hail growth, wind shear influence 3=1437
- hailstone formation study by isotopic analysis. 3=25885
- hailstones, density and structure 3=11400
- hailstones, formation, theories 3=13674
- hailstones, heat and mass exchange 3=18506
- hailstones, influences on growth 3=1443
- hailstones, large 10 cm. dia. formation 3=13675
- hoar frost formation on frozen water drops in electric field 3=11397
- ice nuclei and moon phase, meteor impact theory 3=21038
- ice nucleus concn., lunar influence 3=11399
- ice nucleus meas. in stratosphere. 3=25887
- ice, spongy spheres in atmosphere, radar meas. 3=9041
- implications of raindrops-size distrib. with height. 3=25883
- impurity distrib., effect on 3=5193
- lunar component obs. 3=3462
- lunar synodical period correl. 3=3461
- mesopause, ice cloud formation 3=1440
- mother-of-pearl clouds, model 3=1441
- particulate matter deposition 3=9023
- radar echo patterns, vertical sections 3=13670
- radioactivity, artificial 3=9057
- rain, artificial prod., review 3=11206
- rainfall, daily means, statistical randomness 3=3460
- solar radiation absorpt., spectr. meas. 3=1434
- stratus cloud, radiation fogs, drizzle formation 3=1442
- two spheres falling in viscous medium, collision efficiencies 3=23844

radiation belts

- angular anisotropy of charged particles 3=9110
- artificial, with fission β -ray source 3=16290
- artificial, July 9, 1962, combined satellite data 3=16286
- artificial, July 9, 1962, second belt, Traac satellite obs. 3=16289
- artificial, July 9, 1962, synchrotron radiation from electrons 3=16227

Atmosphere—contd

radiation belts—contd

- artificial, July 9, 1962, synchrotron radio noise from electrons 3=16226
- artificial, July 9, 1962, synchrotron radiation from trapped electrons 3=16228
- artificial, July 9, 1962, Traac satellite obs. 3=16287
- artificial, July 9, 1962, trapped particle fluxes and spectra 3=16288
- artificial, due to July 9, 1962 explosion, conference 3=13807
- artificial, July, 1962, electron distribution, Telstar meas. 3=13808
- artificial, July, 1962, Injun 1 obs. 3=13809
- artificial, Sept. 1 to 5, 1962, satellite meas. 3=16285
- artificial, from "Starfish" nuclear test 3=23635
- auroral zone, X-ray pulsations, 1 to 15 sec period 3=13813
- in cosmic-ray and earth-storm conference, Kyoto, 1961 3=15054
- diurnal variation, 1000 km over North America 3=13811
- earth magnetic field, micropulsations, fine structure 3=25954
- effect of nuclear explosion of July 9, 1962 3=6967
- electron bombardment and trapping meas. 3=13792
- electron diffusion; particles with mirror points 3=9112-13
- electron flux, intense, 1000 km in auroral zone, Injun I, 25 Sept. 1961 3=1472
- electron precipitation during magnetic storms 3=9117
- electron precipitation with ionospheric current systems, in auroral zone 3=1473
- electron scattering, criticism of Hess and Poirier calculation 3=11461
- electrons, energetic, rel. to auroral absorption of radio waves 3=13812
- electrons, high-energy, from cosmic-ray neutrons 3=11456
- electrons, injected by high-altitude nuclear detonations 3=9114
- electrons, trapped, release from tubes, rel. to aurora 5577 A 3=13800
- electrons, trapped, time histories for L = 1.18 to L = 1.30 3=16291
- geomagnetically trapped rad. due to nuc. explosion 3=5224
- inner, electron intensity 3=13814
- inner, inner boundary meas. 3=9107
- inner, trapped proton energy spectrum 3=18563
- inner zone intensity variations, Oct., 1959-Dec., 1960, discussion 3=11459-60
- intensity distrib. below belts 3=11462
- magnetic field, ring current 3=16293
- magnetic mirror geom., pitch angle diffusion 3=9810
- mirror effect demonstration 3=16284
- model ring current belts, magnetic moment 3=13810
- observations, Aug.-Sept., 1959, rel. to magnetic storms and aurorae 3=13817
- origin of short-period geomag. pulsations 3=25955
- outer, at 320 km, particle distrib. meas. 3=9108
- outer, aurora, from Cape Town anomaly 3=23640
- outer, boundary on high latitude side 3=9106
- outer, electron lifetime and precip. into atmosphere 3=9118
- outer, intensities, and ionosphere, F-region, crit. freqs. 3=16275
- outer, obs. Aug. and Sept. 1959 3=13818
- outer, review of development of knowledge 3=16283
- outer, structural changes, rel. to magnetic storm, Sept. 30, 1961 3=21069
- outer (25-55) $\times 10^3$ km, electron intensity 3=9115
- outer-zone electrons, obs. Aug.-Sept. 1959 3=3515
- particle distrib. at 320 km rel. to mag. anomaly 3=9109
- particle motion and energy spectra, review 3=23642
- particles trapped in magnetosphere, motions 3=13815
- proton, quiet-time, 2.5-8 earth radii, rel. to mag. fld. distortion 3=1492
- protons, geomag. trapped, asymmetry effects, at high energy 3=16292
- protons, geomag. trapped, east-west asymmetry 3=18564
- protons in outer zone 3=11457
- protons > 350 MeV, trapped 3=23639

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1. The first part of the document is a list of names and dates, which appears to be a record of some kind. The names are written in a cursive script, and the dates are in a more formal, printed style. The list is organized into two columns, with names on the left and dates on the right.

一、**江蘇省**
 1. **南京市**
 2. **鎮江**
 3. **揚州**
 4. **無錫**
 5. **蘇州**
 6. **常州**
 7. **南通**
 8. **徐州**
 9. **淮安**
 10. **清江浦**
 11. **高郵**
 12. **寶應**
 13. **興化**
 14. **靖江**
 15. **泰縣**
 16. **如皋**
 17. **海門**
 18. **啟東**
 19. **崇明**
 20. **南匯**
 21. **川沙**
 22. **南匯**
 23. **川沙**
 24. **南匯**
 25. **川沙**
 26. **南匯**
 27. **川沙**
 28. **南匯**
 29. **川沙**
 30. **南匯**
 31. **川沙**
 32. **南匯**
 33. **川沙**
 34. **南匯**
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Atmosphere -- contd**upper -- contd**

- heating by hydromagnetic waves. 3=25919
- hydrogen conc., 550, 1000 km, from nightglow, u.v. 3=11431
- hydromagnetic waves, freq. cut-off 3=18304
- ionization, UK1 (Ariel) satellite data 3=18235
- ionized gaseous envelope, space vehicle data 3=3484
- irregularities, movement in mag. field, theory 3=23905
- Italian research programme by sounding rockets 3=1455
- Joule heating and electronic temp. 3=9064
- Magnetosphere, energetic particles prodn. 3=3512
- magnetosphere, plasma energization theories 3=12699
- magnetospheric interchange instability 3=11464
- mesocyclone, wind meas. 3=9063
- meteor velocity, det. from photogr. records 3=5220
- models, for solar-cycle variation 3=9085
- molecular weight at night, 100-210 km 3=21048
- movement meas. from tracer obs. 3=25906
- movements, sources of energy 3=11419
- night, grav. separation, mass spectr. meas., 100-210 km. 3=25917
- optical scatt., wavelength and altitude depend. 3=23626
- property parameter tabulation and instrumentation 3=5210
- radiation intensity at night at 8640 Å 3=23627
- subionospheric, chemical reaction rates. 3=25872
- wind, night, from chemiluminescence. 3=25918
- satellite obs., drag on Explorer 9 3=3831
- spectra, enhancement, 5577 Å 'O1' and aurora 3=21067
- standard, UE, 90-700 km, revision 3=18234
- sunlit, He i.r. emissions 3=18282
- sunrise, sunset times, 70, 110, 250, 350 km. 3=18288
- terrestrial-ionospheric cavity, resonance rel. to thermonuclear explosion, 9 July 1962 3=3485
- transport processes 3=21048
- turbulence 3=11420
- turbulence, 90-130 km, review 3=13698
- turbulence, rocket meas. 3=3479
- turbulence, seasonal variation 3=13693
- USA standard atmosphere, 1962, up to 700 km 3=5187
- v.l.f. emissions, rel. to geomag. pulsations 3=11472
- wind, meas. April 1961 3=9082
- wind meas., 74 to 160 km 3=21045
- H distrib. in outer atmosphere 3=13788
- He excitation of λ 10830 3=13789
- He ionized atoms, escape mechanism 3=13692
- He⁺, abundance, rel. to reactions with O₂ and N₂ 3=3482
- He⁺-O₂ collisions, laboratory expt. 3=21707
- He³⁺, lifetimes, thermal diffusion vel. and escape rates in lower thermosphere 3=5209
- N, electron recombination 3=21717
- N₂, pressure up to 400 km 3=9087
- O/O₂ 3=18522
- O-O₂-N₂ var., 100-210 km, mass spectr. data 3=3481
- O₂ abundance variation 3=1468
- OH emission, review and origins 3=13785

Atmospheric acoustics

- acoustic-gravity wave propag. 3=9061
- booms from aircraft in manoeuvres 3=16893
- infrasound effects, natural 3=18233
- noise generation from turbulent atmosph. 3=25914
- scattering in turbulent media, theory. 3=25915
- sound channels 3=23588
- subacoustic waves from nuclear explosion "outside" atmosphere 3=9060
- turbulence effects on propag. over ground 3=21043

Atmospheric disturbances

See Atmosphere, movements; Thunderstorms.

Atmospheric electricity

- See also Atmosphere, radioactivity; Atmospheric; Aurora; Electromagnetic wave propagation, atmosphere; Ionization, atmosphere; Ionosphere; Lightning; Thunderstorms.
- auroral precipitation, long period, and X-rays, hydromag. disturbances 3=23631
- charge formation, chemical processes. 3=25890
- clouds 3=18505

Atmospheric electricity -- contd

- clouds, cumulus, initial electrification, rel. to space charge 3=9039
- cumulus cloud initial electrification, rel. to space charge. 3=25884
- electrode effect during night-time low-wind periods 3=23593
- electrojets, auroral, theory 3=18560
- equatorial electrojet, longitude variation 3=6999
- Greenland ice cap air, cond. 3=1449
- ionospheric elec. field, rel. to O^(D) lines 3=23633
- microwave breakdown 3=4096
- potential gradient and conductivity, 200-300 mb level, increase due to cirrus clouds 3=18512
- potential gradient, lower troposphere, var., Poona 3=18513
- potential gradient, var. with weather, Poona, IGY 3=18514
- prospecting, effect of surrounding medium 3=3425
- on rain, tropical, continuous, quite, origin 3=13671
- review. 3=25889
- ring current, main-phase, generation 3=9131
- ring currents, rel. to whistlers 3=11411
- vertical convective current 3=5203
- vertical elec. current meas. 3=6964

Atmospheric optics

See also Airglow; Sky brightness; Sunlight; Twilight; Visibility

- "anomalous transparency" 3=9044
- clouds, noctilucent, Alaska 3=9095
- contrast reduction by turbulence 3=6962
- counter glow, sunlight scatt. by interplanetary particles 3=1469
- dispersion theory, accounting for curvature of layers 3=23592
- earth's thermal radiation, ang. distrib., theory 3=23564
- i.r. continuum 3=11409
- i.r. transmission, rel. to height and slant angle 3=18550
- i.r. transmission, review 3=3468
- i.r. transmission to solar radiation. 3=25888
- light beam attenuation in cloud layer 3=3467
- night sky intensity at 8640 Å up to 200 km 3=23627
- nightglow brightness, effect of scatt. 3=18280
- polarization of sky light, calc. 3=1445
- radiation refl., ang. and spectral distrib., theory 3=23565
- rainbow, primary, caustic locus 3=9577
- refractive index irregularities, troposphere 3=9051
- scattering coeff., wavelength and altitude depend. 3=23626
- scattering, effect of lunar atmosph. tide 3=6988
- scattering in lower atmosph., nephelometry 3=6963
- setting sun, effect of refraction, as seen from space 3=23591
- sky light polarization, percentage and direction 3=1447
- spectrographic and interferometric equipment 3=3509
- starlight scintillation, atmosph. turbulence model 3=23653
- transmissivity of Elsasser band 3=15322
- transparency, anomalous and "selective", Buger's applic. and reversion effects 3=3466

Atmospheric pressure and density

- above 200 km, effect of solar wind, from deceleration of Explorer I (1958-62) 3=9068
- explosion, 30 Oct. 1961, global effects 3=9036
- night, mass spectr. meas., 100-210 km. 3=25917
- numerical forecast at various levels 3=3452
- parametric representation methods. 3=25878
- and sun flocculi 3=23589
- upper atm., scale height from satellite orbits 3=3480
- variations rel. to time & solar activity 3=1426
- vars. due to nuclear explosions, period & amplitude relation 3=13667

Atmospheric spectra

See also Atmospheric optics.

- absorbance of solar i.r. bands, calc. 3=18551
- airglow, anomalous rise in 5577 Å region 3=13780
- airglow, NO β , γ , δ bands, N atom concn. 3=3508
- airglow, O green line, dynamical analysis 3=13790
- airglow, oxygen, synthetic 3=6989
- airglow, 3000-12400 Å, IGY atlas 3=9098
- aurora, during SSC 3=11452

Atmospheric spectra — contd

- aurora, 52/02 A [NI] doublet meas. 3=9105
- aurora, green line, mag. storm effects 3=11453
- aurora, H α (H β) emission, rel. to charge separation 3=3514
- aurora, I.G.Y., I.G.C. research 3=16282
- aurora, from nuclear detonation, OI, N $_2^+$ emissions 3=13799
- aurora, and OI, 5577 A, enhancement 3=21067
- aurora, polar glow, in PCA events 3=13795
- aurora, polar, width of green line 3=16281
- infrared horizon 3=16435
- nightglow, continuous and [OI] 5577 A emission 3=9102
- nightglow, H α emission, origin 3=6992
- nightglow, I.G.Y., I.G.C. research 3=16282
- nightglow, OH bands, transition probabilities 3=23628
- nightglow, 3700-4650 A spectrum 3=6991
- night sky, OH bands 3=13783
- night sky, 5550-6750 A, 66° 40' S, 140° 1' E, May-Nov. (1957) 3=6990
- night-time red band, rel. to F region 3=13774
- OI, 5577 A, enhancement, and aurora 3=21067
- of projectiles, high-speed in rarefied air 3=7335
- sky emission, 15-26 μ , meas. 3=18548
- sky light, 0.3 to 1.0 μ , photoelec. spectrophotometer meas. 3=1448
- spectrographic equipment and techniques 3=3509
- twilight airglow, 1.58 μ Δ - Σ band, theory 3=25933
- twilight, Li emission changes in Nov. 1962 3=13782
- twilight, Li resonance line excitation 3=13781
- twilight, metallic emissions, rel. to dynamics 3=13791
- upper atmosph. emissions, theory, conference 3=9066
- u.v. radiation theory for upper atmosph. 3=9187
- CO $_2$ weak telluric band 3=9045
- He, λ 10830, excitation in upper atm. 3=13789
- He I λ 10830 A, twilight obs. 3=3510
- O(D) red lines, rel. to ionospheric elec. field 3=23633
- O microwave .3=13679
- O $_2$, absorption lines, microwave frequency 3=22548
- O $_2$ absorpt. at 4.75 μ of solar spectrum 3=18549
- O $_2$ layer concn. up to 60 km 3=23581
- OH band, (9-3) (6-1), rotational temperature 3=9097
- OH emission in upper atm., origin 3=13785

Atmospherics

- a.f., 140 c/s, effect of earth cond. inhomogeneities 3=16230
- amplitude and phase spectra of radio-atmospherics 3=25891
- apparatus, counting, for statistical study, mag. recording 3=23600
- background signals, around 1c/s 3=13684
- chorus, high-latitude investigation 3=11413
- chorus, rel. to cosmic radio noise absorpt. 3=23618
- class IV, correl. with new class of solar flares 3=16376
- from cloud-to-cloud discharges 3=9049
- e.m. propagation guided along atmospheric or exospheric layer 3=14779
- enhancement by nuclear explosions at high altitude 3=1450
- due to explosion, nuclear, high-altitude, 10 kc/s 3=16306
- hourly variation of seasonal levels (Bangalore) 3=3474
- impulsive, short-term time characteristics 3=3472
- integrated field and thunderstorm times 3=23597
- lightning, radiation field charact., 1-100 kc/s 3=23598
- long-term amplitude probability distrib. 3=3473
- long-wave (27kc/s), night time, enhancement by sudden ionospheric disturbances 3=6965
- mesosphere, l.f. properties, rel. to cosmic radiation 3=11414
- musical, correl. with lightning discharges 3=13680
- plasma, current-carrying, energy conversion mechanism 3=7527
- polar chorus, < 1500 c/s, Godhavn, 1957-1961 3=18518
- radio noise anomalies, August 1958 3=23595
- satellite "topside" obs., v.l.f., whistlers and noise 3=21056
- statistical amplitude spectrum 3=23603
- structure, improvement of existing data 3=3470
- sudden enhancement study on 27 kc/s 3=9046
- sun, bursts, and flare importance, 200-9400 Mc/s 3=16377
- sunrise and sunset effects at 27 kc/s 3=9048
- sweepers, rel. to solar activity 3=3475
- synchrotron radiation from high-energy electrons 3=16228

Atmospherics — contd

- synchrotron radiation rel. to artificial radiation belt electrons 3=16227
- synchrotron radio noise obs. at mag. equator, rel. to July 9, 1962 nuclear explosion 3=16226
- v.l.f. emissions analysis rel. to exosphere 3=23619
- wave-forms, phase-frequency spectra analysis 3=6966
- waveforms, daytime, summer, Calcutta (1961-2) 3=13683
- waveforms, rel. to lightning discharge 3=9047
- whistler dispersion, variations and correl. 3=11412
- whistler, rel. to lightning 3=23599
- whistlers, attenuation by electrons with E $^{-1/2}$ distrib. 3=9050
- whistlers, dispersion after mag. storm 3=11410
- whistlers, electron energies meas. 3=13700
- whistlers, hook mode echoes testing parameters 3=13694-5
- whistlers, obs. at closely spaced stations 3=13681
- whistlers, propagation, application of refractive-index theory 3=9730
- whistlers, rel. to magnetospheric ionization density profile knee 3=13728
- whistlers, rel. to solar activity 3=13682
- whistlers, ring current effect analysis 3=11411

Atomic beams

- See also Velocity analysis, particles.
- as α -particle scatterers 3=6094
- hydrogen, neutral, prodn. from H $_2^+$ ions 3=2585
- inert-gas, bombard. metal surfaces, energy transfer 3=22511
- plasma production by injection 3=1964
- range in solid from sputtering yield 3=5721
- range in solids 3=8462
- recoil technique for electron scatt. meas. 3=2582
- resonance frequency shifts, rel. to atomic clock operation 3=10478-9
- resonance, in calc. of nuclear moments 3=2362
- scatt. cross-sections, rel. to di-atom bound states, velocity 3=4726
- Ca, surface ionization, from W 3=24226
- Cs, frequency standard, operation and improvements 3=13992
- Cs scattering, on Hg crossed beam, diff. cross-sect. velocity dep. 3=2586
- H, in metastable state 2S, prod. 3=2584
- H, in molecular gases, electron interchange 3=6342
- H, neutral, energetic, inverted cascades 3=12076
- H, 20 keV, high-intensity source 3=25070
- In 117 , spin, 45 min. ground state, by mag. reson. 3=17391
- K, for m.f.p. det. in A, teaching apparatus 3=6367
- K scattering, on Hg crossed beam, diff. cross-sect. velocity dep. 3=2586
- K, scatt. by Xe, velocity depend. of cross-section 3=711
- Li, scatt. by Xe, velocity depend. of cross-section 3=711
- Sr, surface ionization, from W 3=24226
- Tl 205 , frequency standard 3=13990

Atomic mass

- See also Isotopes; Mass spectra.
- differences, medium and heavy regions, mass spectroscopic data 3=17545
- review and tabulation 3=10221
- Sb 121 , 123 , and neutron separation energies 3=714
- Sn and Sb isotopes 3=8215
- Sn $^{116-120}$, 122 , and neutron separation energies 3=714
- Zr 90 -Zr 92 , Zr 94 -Zr 96 mass diffs. 3=12627

Atomic weight

- No entries this year

Atoms

- See also Atoms, mesic; Elements; Nucleus; Positronium.
- alkali metals, electric dipole polarizabilities meas. 3=6357
- assemblies, small-angle critical scatt. 3=52
- charge-exchange between gaseous ions and atoms 3=4026
- collisions, atom-atom, resonance effects 3=6364
- collisions, hard-core type model 3=12783
- collisions, low-energy, charge transfer 3=10477
- collisions, resonant charge exchange, theory 3=16909
- collisions with ions, prod. by Lyman- α 3=6366
- collisions with mol's., resonance, semiclassical approx. 3=22612
- concentration in gas det. by catalytic probes 3=18430

Atoms — contd

diamagnetic susceptibility, Thomas—Fermi model 3=4702
 drift speed, rel. to mag. disturbances 3=3490
 electron loss in proton collisions 3=10476
 electron polarizability, Thomas—Fermi model 3=4702
 energy splittings in cubic symmetry fields 3=12901
 Faraday rotation in atomic spin system, theory 3=22489
 fluorescence, L-shell, in heavy elements 3=19953
 free, recombination, heterogeneous on metal surfaces 3=8224
 halogen, electron affinities 3=12759
 halogen, electron affinities 3=2565
 inert gases, repulsive interaction potentials 3=12782
 interaction calc. including radiative corrections 3=6365
 interaction potentials from scatt. velocities meas. 3=15305
 interactions, Hellman—Feynman theorem, perturbation theory 3=25033
 internal conversion of γ -rays, theory 3=22318
 ionization potentials and electron affinities, calc. 3=8214
 light emission, modulation in double reson. expt. 3=10471
 light scatt., redistribution functions 3=7358
 magnetic dipoles, neutral, containment, toroidal 3=15271
 magnetic interaction calc., review 3=3090
 magnetic interactions, use of Dirac vector model 3=18055
 many-atom system, second quantization represent. 3=21257
 phase shifts for Thomas—Fermi and Hartree potentials 3=8171
 photoelectric effect, K-shell, forward and backward 3=2588
 photoelectric effect, K-shell, integrals eval. 3=18688
 photoionization from outer subshells, model 3=708
 polarizabilities and shielding factors, theory review 3=8173
 polarizabilities and Sternheimer shielding factors 3=17518
 polarizability, electronic, of free neutral atom 3=6356
 polarization from i.r. absorpt. intensities 3=12809
 quantum mechanical description 3=12747
 range in solids 3=10571
 rare gases, charge exchange cross-sections 3=12082
 recombination rate meas. in shock tube 3=18905
 relaxation in solids, radiation and thermal interaction 3=20070
 resonance lines in plasma, Doppler-broadened, radiative transfer 3=9813
 scattering by homonuclear diatomic mols. 3=22611
 scattering cross-sections, extrema in velocity dependence 3=17544
 scattering, inelastic 3=15302
 scattering, "rainbow" effect, interpretation 3=12784
 statistical model, correlation correction 3=8172
 Thomas—Fermi—Dirac, rel. to eqns. of state at very high pressures 3=775
 Thomas—Fermi theory, classical approx. 3=697
 in III-V compounds, polarizabilities, and mol. effective charge 3=17637
 transition probabilities, bibliography 3=2547
 in transport process systematization 3=5392
 trapping and energy transfer in collisions with crystal surface 3=8923
 vibrational energy exchange 3=2546
 X-ray scatt., sum rules involving screening const., self-energy 3=12775
 $Z \leq 12$, stopping cross-sections in C 3=22510
 Ar, collision of Ar^+ at keV energy, inelastic energy loss 3=709
 Ar^{++} , ionization potential, corrected value 3=8214
 Ar—Li scatt., interact. potential eval. 3=15305
 Be, photoelec. K-absorpt. cross-section 3=6350
 Br⁻, gaseous absorption spectra 3=2565
 Cl, transition probabilities 3=702
 Cl⁻, gaseous absorption spectra 3=2565
 Cs, elec. charge, upper limits 3=10091
 H, charge exchange, resonance 3=6361
 H, coherent scattering of light, calc. 3=4715
 H, collisions with ions, prod. of Lyman- α radiation 3=6366
 H, collisions with nuclei 3=4701
 H, electron capture by protons 3=12781
 H-like, forbidden transitions, rel. to nuclear quad. moment 3=2558
 H, ortho—para conversion, in surface mag. meas. 3=1128

Atoms — contd

H⁻ photodetachment, empirical analysis 3=19180
 H, production cross-sect., by proton capture 3=4717
 H—p scattering, rearrangement collisions 3=4722
 He, collision with ions, prod. of Lyman- α radiation 3=6366
 He, collision of two, Born approx. calc. 3=710
 He, electron capture by α -particle passing through 3=9720
 He ($1s^2$), electron capture by protons 3=15304
 He, interaction energy with H_2 , calc. 3=17622
 He, X-ray scatt. factors, Schwartz method 3=10445
 He—He repulsion 3=10508
 He—He Rosen interaction potential 3=10507
 He⁴, three-body bound state, binding energy 3=25109
 HfIII, Slater parameters 3=703
 Hg, γ -ray Rayleigh scatt. by K-electrons 3=8213
 Hg, 6(³P₁), electrophilic character, in photosensitized reactions 3=25053
 I, recomb. to I_2 in NO, rel. to concn. 3=2668
 K, elec. charge, upper limits 3=10091
 K, scatt. by various atoms and mols. 3=4788
 Kr—Li scatt., interact. potential eval. 3=15305
 Li, photoelectric K-absorption cross-section 3=704
 Li⁴ scatt. by Xe, cross-sections 3=15306
 Li⁷ scatt. by rare gases, cross-sections 3=15306
 Li sequence, dipole polarizability 3=22483
 N, electron capture by protons, p-orbital 3=15303
 N, oscillator strength, Hartree—Fock calc. 3=4708
 Ne—Ne⁺ collisions, electron capture and stripping 3=4725
 Neⁿ⁺—Xe, and Xeⁿ⁺—Ne collisions; ionization 3=2583
 O, electron capture by protons, p-orbital 3=15303
 O, recombination by Ar catalysts 3=13595
 O, recombination in inert gases 3=13597
 Pb, L-shell fluorescence meas. 3=4711
 Pt, L-shell fluorescence meas. 3=4711
 Rb spin relaxation induced by H_2 and rare gases 3=4723
 Tl, L-shell fluorescence meas. 3=4711
 Xe, interaction, potential energy curve 3=8212
 Xe, scatt. of Li and K beams, velocity depend. 3=711
 Xe—Li scatt., interact. potential eval. 3=15305
electron scattering
 asymmetry in double scatt., polarization 3=22499
 collision theory, polarization potential, variational method 3=713
 collision theory, single-electron approx. 3=2576
 cross-sections and polarization, 50 keV 3=22496
 cross-sections, determ. from elec. cond. of ionized gas 3=22509
 electron—electron, low-energy spectrum calc. 3=14955
 free and bound atomic electrons, fast scattering, and braking 3=22505
 free—free transitions of electron in ion field 3=22497
 inert gases, extrapol. to zero energy 3=12777
 measurement, low energies, from spectral line broadening, Lindholm's theory 3=25063
 multiple scatt., relativistic corrections to small angle theory 3=6363
 one-electron, use of hypervirial theorem 3=22500
 potentials, calculation, Racah method 3=8206
 quantum defects and scattering lengths 3=4720
 screening effects, relativistic electron-scatt. 3=22494
 Thomas—Fermi atom, low energy, elastic, rel. to periodic system of elements 3=12774
 velocity depend. of total cross-section at $< \sim 1$ eV 3=22507
 Ar, elastic and inelastic, 25 keV 3=22495
 Au, elastic, 150–1900 eV, 30°–155° meas. 3=12779
 C, differential and total elastic and inelastic cross-sections 3=21890
 Cs, cross-section determ., from elec. cond. of ionized gas 3=22509
 Cs, elastic, slow electrons, adiabatic model 3=25064
 Cs, elastic, slow electrons, model 3=12776
 Cs, slow, meas. in discharge 3=4724
 H allowed transitions up to $n = 10$ 3=10473
 H atoms, spin exchange 3=15299
 H, convergence of close-coupling expansion 3=22501
 H, cross-sections in Born approx. to reactance matrix 3=22503
 H, e⁺, phase shifts, calc. 3=53
 H—e collision wave-function 3=2577

Atoms — contd

electron scattering — contd

- H—e system, 1S state, resonance levels 3=22504
 H, elastic, rel. to strong bond and exchange 3=10472
 H, elastic, triplet S-wave phase shifts 3=8210
 H, electrons and positrons, 11.0–54.4 eV, close coupling approx. 3=8211
 H, excitation $1S-2S$, second Born approx. including exchange 3=22506
 H, excitation of $2s$, $2p$ levels, 10–50 eV 3=17541
 H, incident s-wave distortion 3=10466
 H, inelastic, degeneracy effects 3=4721
 H, ionization, rel. to interference 3=4018
 H, meas. by elec. conductivity method 3=6360
 H, near $2s$ excit. threshold, resonances 3=22508
 H, phase shifts below inelastic threshold 3=8205
 H, phase shifts below inelastic threshold 3=25067
 H, positrons 3=17542
 H, self-consistent calc. 3=2578
 H, slow electrons, rel. to $2s$ and $2p$ level excitation 3=15298
 H, up to 9 eV, calc. 3=17540
 H, use of hypervirial theorem 3=22500
 H, with positrons, s and p-wave, theory 3=2579
 He³, compared with T 3=25065
 He, double excitation 3=19951
 He, elastic, at nearly zero energy 3=10475
 He, elastic, sharp resonance at 72° of 19.3 eV 3=10474
 He, excitation of 2^1P and 3^1P states 3=25066
 He, induced radiation, polarization 3=17543
 He, optical radiation, polarization 3=8208
 He, polarization of emitted light, mag. field depend. 3=6362
 He, relative optical excitation functions 3=12778
 He, resonance in elastic scattering 3=15300
 Hg, 1–2 keV electrons, polarization 3=12780
 K, 1–10 eV, total cross-section 3=2582
 Li, 1–10 eV, total cross-section 3=2582
 N, 1–6–10 eV electrons, cross-section 3=8207
 Na, 1–10 eV, total cross-section 3=2582
 Na, optically pumped, thermal scatt. 3=12771
 T, compared with He³ 3=25065
 Xe, elastic and inelastic, 25 keV 3=22495

excitation

- "anticrossings" in optical resonance fluorescence 3=25061
 atom-ion collisions, rel. to electron loss 3=712
 Auger effect, K-LL, calc. 3=8198
 Auger electrons, K-LL probabilities, $Z = 65$ to 92 , calc., relativistic effects 3=10467
 autoionizing level, reduced width, R-matrix theory 3=25037
 collisions, atom-atom, resonance effects 3=6364
 collisions, electronic-vibr. energy transfer, theory 3=6433
 de-excitation, Auger electron ejection on superconducting target 3=9826
 diatomic mols., rel. to vaporization of solid 3=740
 double, by one quantum, Cd in mag. field 3=22491
 electron collision theory, polarization potential construction method 3=713
 electron impact, classical calc. of probab. 3=22492
 electron radiation in altern. mag. field 3=17536
 energy levels in isoelectronic sequence, empirical relations 3=17522
 fluorescence, L-shell in heavy elements 3=19953
 fluorescence, modulation in double reson. expt. 3=10471
 free-free transitions of electron in ion field 3=22497
 heavy particles, transition probabilities and cross-sections 3=707
 high-temp. arc jet, levels up to 13eV 3=24259
 highly-ionized, energy level determinations, NBS programme 3=9591
 inelastic collisions, theory 3=2574
 inert gases, electron excitation cross-sections 3=22005
 inert gases, energy loss processes of Li^+ and Na^+ 3=19186
 inert gases, energy losses, resolution by optical emission analyser 3=21880
 ionization, electron shells, meas. 3=10286

Atoms — contd

excitation — contd

- ions, by electrons, with Coulombic wave functions 3=19950
 ions in gases, electron loss 3=7448
 $J=\frac{1}{2}$ state, level crossing, optical detection 3=8201
 lifetime of excited state meas. 3=12056
 light atom collisions, inelastic adiabatic approx. 3=8203
 magnetic dipole radiation, stimulated emission 3=25059
 metals, in halide flames, var. with active N 3=22605
 multielectron, in radiative recomb. of ions 3=7432
 optical excitation data, processing and recording 3=2575
 photoelectric, K-shell, high-energy calc. 3=12773
 photoelectron method for det. of h/e 3=1575
 radiation, stimulated emission, in strong e.m. field 3=17069
 radiation transitions in relativistic treatment 3=2549
 rare earths, Auger electron groups, K, relative intensities 3=10468
 resonances, possible, e.m. field, calc. 3=10470
 resonant absorption of several oscillating fields, nonlinear effects 3=2144
 shock front distrib., radiation meas. 3=14243
 in standing wave field, stimulated and spontaneous emission 3=25062
 in stellar atmospheres, rate of collisional excitation 3=3597
 transition probabilities, oscillator strengths using Coulomb approx. 3=2548
 $2s-2p$ transitions, maser oscillations 3=6358
 two-level system coupled to radiation field 3=3744
 wall collisions, optical pumping study 3=17537
 X-ray satellite spectra, screening effects 3=10443
 $Z = 38-46$, photoelectron meas. of L levels 3=2590
 Ag^+ , quadrupole antishielding factor 3=12772
 Ar after sputtering Cu, 5–20 keV 3=4217
 Ar, inner atomic shells, by X-rays 3=25058
 ArII, by H^+ and He^+ impact 3=12770
 C, photoionization of lower excited states 3=25048
 Cd, in mag. field, two levels by one quantum 3=22491
 Ce I, low levels 3=19933
 Co II, relative oscillator strengths 3=8181
 Cr-ruby 4E state, lifetime, from laser intensity versus time meas. 3=6648
 Cs, double-photon absorption 3=6359
 Cu, sputtered by Ne, 5–20 keV 3=4217
 Fe^{++} , quadrupole antishielding factor 3=12772
 Ga^{++} , quadrupole antishielding factor 3=12772
 H, collisional, cross-sections rel. to energy 3=12076
 H, by electrons, Born partial-wave integrals 3=22503
 H, by electrons, cross-sections, linear Stark effect 3=25044
 H, by electrons, exchange and $1s-2s-2p$ coupling 3=15297
 H-e collision wave-function 3=2577
 H-H collision, electronic-vibr. energy transfer 3=6433
 H, incident s-wave distortion in ionization by electrons 3=10466
 H, metastable state, by fast protons 3=4716
 H, by synchr. radiation of relativ. electrons 3=11569-70
 H, $1s \rightarrow 2s$ and $1s \rightarrow 2p$, by electrons, rel. to strong bond and exchange 3=10472
 H, $1S-2S$, by electron impact, second Born approx. 3=22506
 H, $2p$ level 3=2555
 H, $2s$, $2p$ levels, by electron collision, 10–50 eV 3=17541
 H, $2s$ and $2p$ levels, by slow-electrons 3=15298
 $H^+ + H(1s) \rightarrow H(2s \text{ or } 2p) + H^+$, theory 3=9732
 He, double, by e impact 3=19951
 He, by electrons, induced radiation, polarization 3=17543
 He, by electrons, light polariz. meas. 3=8209
 He, by electrons, polariz. of light, mag. field depend. 3=6362
 He, by electrons, spectral line polariz. 3=2581
 He, by p and d impact, 40–200 keV 3=8199
 He, by protons, transitions meas. 3=2560
 He, metastable, deactivation by proton impact, up to $16000^\circ K$ 3=4718
 He, optical radiation due to electron impact 3=8208
 He, photo-ionization 3=25047

Atoms — contd

excitation — contd

- He, polarization of electron impact radiation 3=4719
 He, relative optical excitation functions 3=12778
 He, in solar chromosphere 3=13889
 He to 4'D state, by collision transfer 3=2580
 $\text{He}^{2+} + \text{H}(1s) \rightarrow \text{He}^+(2s \text{ or } 2p) + \text{H}^+$, theory 3=9732
 He^3 , 2'S_{1/2}, optical pumping, and polarized He^3 target prod. 3=15050
 Hg—diatomic mol. collisions, electronic—vibr. energy transfer, theory 3=6433
 Hg, metastable, collision disorient., relax. time 3=15301
 K, arc lines 3=17533
 K-shell photoelectron ang. distrib. 3=2587
 K and M level double excitation by X-rays 3=25057
 KrII , by H^+ and He^+ impact 3=12770
 Li, dipole transition probabilities, approx. calc. 3=19937
 Li^+ , photo-ionization 3=25047
 Mn^{2+} , quadrupole antishielding factor 3=12772
 $\text{N}, \text{A}^3\Sigma_u^+$ state, half-life 3=19940
 N, metastable, auroral afterglow 3=2570
 N, metastable, production in elec. discharge 3=2571
 N, photoionization of lower excited states 3=25048
 Na—diatomic mol. collisions, electronic—vibr. energy transfer 3=6433
 Na, level population inversion in glow discharge 3=8177
 Na, optical excitation function meas. 3=10469
 Nd activator in glass, optical quantum generator 3=25444
 Nd, 4F_{5/2}-state, lifetime, from laser intensity/time meas. 3=6648
 Ne, in discharge positive column, 1–30 mm Hg 3=24238
 Ne^+ , ionization to Ne^{2+} by electrons 3=21703
 Ne, after sputtering Cu, 5–20 keV 3=4217
 NeI , by H^+ and He^+ impact 3=12770
 O^- , in prod. by electron impact on O_2 , CO, CO_2 3=361
 O^{3+} , cross-section, Coulomb–Born approx. 3=4713
 P^{3+} , ionization, on β decay 3=10286
 Pr^{3+} , approx. excited eigenfunctions 3=2572
 Tm^{3+} , approx. excited eigenfunctions 3=2572
 Xe, by Kr, in collisions, in discharge 3=19190

magnetic moment

See also Gyromagnetic ratio.

- localized, in metals, rel. to Mössbauer meas. 3=12908
 μ -mesic, calc. 3=4730
 rare earth ions, in iron garnets 3=6725
 Fe, change at Curie pt. 3=23136
 Fe, in Pd, Rh, Mo metals 3=12908
 He, diamagnetic susceptibility, calc. 3=19929
 V^{3+} , in corundum, mag. suscept. 3=20548

structure

See also Nucleus; Spectra, atoms.

- analytic wave-functions, inclusion of correlation 3=6345
 antiscreening of nuclear quad. moments in ions 3=19923
 binding forces, demonstration model, using potential superposition 3=25036
 bond and orbital electronegativities 3=12807
 constant energy differences in periodic system 3=22472
 correl. of electrons in same shell, exchange polarization in-out effect 3=8175
 correlation effects, many-body perturbation theory application 3=19921
 correlation energy for atomic systems 3=15275
 correlation energy isoelectronic series with 11 to 18 electrons 3=22466
 eigenfunctions, by spin operators 3=17525
 electric field gradients of 5-electron ions 3=6343
 electron affinities, light atoms 3=17519
 electron correl. problem 3=12743
 electron terms in field of two Coulomb centres 3=4701
 energy-level shifts in Debye plasma 3=14566
 energy levels calc., new lower bound 3=19919
 f^6 configuration, application to rare-earth ions 3=15292
 four-electron, generalized product functions 3=10449
 free neutral atoms, electronic polarizabilities
 Thomas–Fermi theory 3=22463
 Gombas statistical model in momentum space 3=22465
 h.f.s., second-order effects of nuclear mag. fields 3=700
 Hartree–Fock calc., errors 3=8169

Atoms — contd

structure — contd

- Hartree–Fock equations, ground-state soln., iterative method 3=22468
 Hartree–Fock equations, new form 3=19914
 Hartree–Fock, for semi-infinite medium 3=10434
 hydrogenic, h.f.s., $\alpha^2 m/M$ corrections 3=10441
 irregular doublet law, rel. to screening consts. theory 3=25039
 K, L, O shell exchange integrals for same nuclear charge 3=2589
 lanthanides, low-lying levels, intermediate coupling 3=15283
 levels, classification and splitting in external fields 3=15276
 levels, inverse population, negative absorpt. coeff. 3=4787
 limiting screening nos., energy parameters, 1S–6D config. 3=12749
 many-electron theory, effect of correlation on orbitals 3=12744
 matrix components of Hamiltonian w.r.t. correl. wave functions 3=6344
 model, semiclassical, in interaction problems 3=2573
 nuclear and relativistic effects 3=12752
 nuclear mag. fields, second-order effects, calc. 3=700
 open shell, antishielding of mag. and elec. hyperfine interact. 3=25038
 orbital momentum, eigenfunctions, projection operator calc. 3=22467
 polarizabilities and Sternheimer shielding factors 3=17518
 quantum chemistry, semi- and non-empirical theories 3=12545
 quantum theory, limits of error 3=10436
 rare earths, energy levels 3=19947
 review of theory, Bohr contribution 3=19915
 screening constants from SCF functions 3=17521
 screening consts., appl. to radii and energy levels 3=15272
 screening parameters for 2, 3 and 4-electron systems 3=10438
 semiempirical one-centre Coulomb repulsion integrals 3=17560
 Slater–Condon parameter, semiempirical calc. 3=2552
 Slater–Condon parameters from spectral data 3=15274
 spin, exact eigenfunctions, projection operator calc. 3=22467
 spin–orbit coupling theory 3=6347
 statistical atom theory 3=15277
 statistical theory, energy eigenvalues and functions 3=10437
 statistical theory, phase shift, determ. 3=8170
 Thomas–Fermi–Dirac potential function, analytical expression 3=23732
 Thomas–Fermi interaction potential, boundary effects 3=17562
 Thomas–Fermi model, groupings by principal quantum number, higher approx. 3=22464
 Thomas–Fermi model, relativistic, nuclear size correction 3=19924
 Thomas–Fermi positive ions, interpolation formulae, graphical 3=7429
 transition metal, first-row, approx. radial functions 3=10435
 two-electron, second-order perturb. energy coefft. 3=6346
 two-electron systems, Hartree–Fock and 1st natural spin orbitals 3=22469
 two-electron systems, quasi-stationary states 3=2554
 two-electrons, electron correl., exactly soluble model 3=4703
 variational analytic wave functions 3=25034
 zero-order effects of interact. of degenerate configs. 3=19920
 Z = 38–46, L_I, L_{II}, L_{III} binding energies 3=2590
 Z=89–98, Hartree wave functions 3=8194
 Ag¹⁰³, h.f.s. in $^3S_{1/2}$ ground state 3=8191
 Al, ground and several excited states 3=22476
 Ar II, statistical model, Slater integrals 3=6349
 B²⁺, isotope shift, open-shell calc. 3=10456
 B³⁺, 2'S state, twenty-parameter calc. 3=2561
 Be, electron pairs 3=12754
 Be, generalized product functions 3=10449
 Be, ground-state energy, calc. from Hylleras wave-function 3=10450

Atoms — contd

structure — contd

- Be²⁺, S-states, variational calc. 3=22471
 Be²⁺, 2³S state, twenty-parameter calc. 3=2561
 Br, theory 3=12755
 Ca, 4s4p³P₁ state, g_J factor meas. 3=2564
 Cl, antishielding of mag. and elec. hyperfine interact. 3=25038
 Cr³⁺, spin level splitting, Jahn—Teller effect 3=10452
 Cs, model, for ionization transients 3=24219
 Cu, electron radial distrib. 3=19934
 Cu, ground and several excited states 3=22476
 Dy³⁺, free, in cryst. field and in ext. mag. field 3=8377
 Er³⁺, free, in cryst. field and in ext. mag. field 3=8377
 Er¹⁹⁹, h.f.s. meas. 3=22479
 Er II, energy levels 3=10453
 Eu¹⁵² (13 yr) 3=7968
 F¹⁹, h.f.s., unrestricted Hartree—Fock calc. 3=12760
 Fe²⁺, antishielding of mag. and elec. hyperfine interact. 3=25038
 Fe²⁺, Sternheimer factors, variational calc. 3=2567
 Fe³⁺, ⁶S_{5/2} state, nuclear quad. splitting in solids 3=8336
 Fe⁵⁷ in compounds and alloys, s-electron density 3=2699
 Fe III, nonlinear effects in theory 3=8185
 Gd³⁺ absorption bands, oscillator strengths 3=19935
 Gd, electronic structure, coupling 3=12761
 Gd³⁺, h.f.s. for Gd¹⁵⁶ 89 keV state 3=628
 Ge⁷¹, h.f.s. of ³P ground state 3=17390
 H⁻, bound-free absorption coeff. 3=2557
 H—e system, total wave-function 3=22501
 H, wave-functions, Gaussian expansion 3=25042
 He, conjugated, π orbital, doubly occupied, correl. energy 3=22576
 He, correlation energies of excited states 3=4704
 He, electron correl., exactly soluble model 3=4703
 He, fifth-order wave function 3=4706
 He, ground state, wave-function expansion 3=25045
 He, ground states, Hylleraas series with fractional powers 3=2559
 He, scattering factors calc. by 6-term Hylleraas wave-function 3=25703
 He, S-states, variational calc. 3=22471
 He, ³S terms, variational calc. 3=4705
 He, (2p²)³P, quasi-stationary states 3=2554
 He, 2³S state, config. interaction method 3=25046
 He, 2³S state, twenty-parameter calc. 3=2561
 He, X-ray scatt. factors, Schwartz method 3=10445
 Hf III, Slater parameters 3=703
 Hg, 2537 Å line, hyperfine structure 3=25054
 Hg, 5461 Å line, quantum numbers 3=10458
 Ho in ethyl sulphate, h.f.s. splitting 3=10572
 Ho³⁺, free, in cryst. field and in ext. mag. field 3=8378
 In, analytical wave functions 3=25051
 K, electron shake-off, following Ar⁴¹ β^- decay 3=19954
 Kr⁸³, (4p)⁵(5s)³ ³P₁ state, h.f.s. 3=8186
 Li, adiabatic approx. 3=8187
 Li, correl. of electrons in same shell 3=8175
 Li, ground state, variation calc. 3=15284
 Li, hyperfine interaction, effect of correl. 3=10455
 Li, isotope shift, open-shell calc. 3=10456
 Li-like ions, hyperfine splitting calc. 3=10457
 Li sequence, ²S and ²P^o states calc. 3=25052
 Li⁺, S-states, variational calc. 3=22471
 Li⁺, 2³S state, twenty-parameter calc. 3=2561
 Lu, L—S coupling, h.f.s. calc. 3=22481
 Lu II levels, g-factors 3=22482
 Mg¹⁰⁺, 2³S state, twenty-parameter calc. 3=2561
 Mn, energy levels 3=19948
 Mn²⁺ in α , β and γ -MnS 3=20072
 MnI, h.f.s. meas. 3=12564
 N, 1s²2s²2p³ states, self-consist. field functions 3=19942
 N, (2p)³ ⁴S_{3/2} state, h.f.s., pressure shifts 3=8188
 N¹⁴, by electron paramagnetic resonance 3=6353
 Nd^{433,146} h.f.s. and nuclear moments 3=4709
 Ne⁸⁺, 2³S state, twenty-parameter calc. 3=2561
 Ni, electron radial distrib. 3=19934
 Ni, energy levels 3=19948
 Ni²⁺, spin level splitting, Jahn—Teller effect 3=10452
 Np⁴⁺, Slater-modified Hartree—Fock calc. 3=12767

Atoms — contd

structure — contd

- O, energy levels 3=22487
 O, 1s²2s²2p³ states, self-consist. field functions 3=19942
 O⁶⁺, 2³S state, twenty-parameter calc. 3=2561
 O¹⁸, ³P₁ hyperfine splitting 3=19945
 O¹⁷, by electron paramagnetic resonance 3=6353
 Pa²⁺—Cf³⁺ ions, Hartree—Fock calc. 3=12767
 Pd II, spectrum and levels 3=12765
 Pu, ground-state 3=10461
 Sb, analytical wave functions 3=25051
 Sc⁴⁺, h.f.s. 3=2361
 Sr, h.f.s., splitting of 5s5p ³P₁ state 3=24842
 Te, theory 3=12755
 Th²⁺, Slater-modified Hartree—Fock calc. 3=12767
 Tm¹⁶⁹, ground state, h.f.s. meas. 3=6355
 U, 5f electrons, indirect relativistic effect 3=8194
 U⁴⁺, Slater-modified Hartree—Fock calc. 3=12767
 V, energy levels 3=19948
 Y⁸¹, h.f.s. 3=2361
 Yb²⁺, free, in cryst. field and in ext. mag. field 3=8379
 Yb¹⁷³, h.f.s., nuclear quadrupole moment 3=2364
 Yb, self-consistent wave functions 3=8197

Atoms, mesic

- H₂ μ^- -mesic transfer to other elements 3=716
 K⁻, decay 3=17546
 K⁻, decay, study of nuclear extreme surface region 3=6369
 K⁻-mesic, formation, de-excitation, K⁻ nuclear capture 3=10480
 K⁻-mesic, X-ray yields calc. 3=17547
 μ , decay rate, weak interact. theory 3=2289
 μ -mesic, collective nuclear level excitations 3=6372
 μ -mesic, disintegration by neighbouring nuclei 3=4729
 μ -mesic, 14 elements, X-ray energies meas. 3=15311
 μ^- -mesic in gaseous H, p-scatt. and μ -transfer processes 3=6371
 μ -mesic, K and L X-ray yields, discrepancy 3=15310
 μ -mesic, magnetic moments, calc. 3=4730
 μ -mesic, neighbouring, 2p-1s energy diffs. 3=10481
 μ -mesic, nuclear hyperfine structure 3=10208
 μ -mesic, on spin $\frac{1}{2}$ nuclei, μ^- -meson depolarization 3=4731
 μ^- -mesic, paramagnetic metals, decay anomalies, search 3=2593
 μ -mesic, 2p \rightarrow 1s transition energy calc. 3=15315
 μ -mesic, X-rays and β -decay 3=4358
 μ -mesic, X-rays, 2p-1s, calculated energies, correction 3=8217
 μ , vacuum polarization from nuc. quad. moment 3=22515
 Ba, μ -mesic, 2P-1S transition energy 3=8218
 Bi, μ -mesonic, X-ray transition energies 3=6370
 Bi²⁰⁹, μ -mesic, dynamic nuclear polarization 3=15313
 Cu, μ^- decay anomaly 3=15312
 Cu, μ -mesonic, X-ray transition energies 3=6370
 F, μ^- polarization, search 3=15314
 Fe, μ^- decay anomaly 3=15312
 Fe, μ -mesonic, X-ray transition energies 3=6370
 Li⁶, μ capture, effect of h.f.s. on 3=17548
 Ne, μ^- nuclear capture 3=15216
 Ni, μ^- decay anomaly 3=15312
 P, μ -mesic, de-excitation 3=6373
 P, μ^- polarization, search 3=15314
 Pb, μ -mesonic, X-ray transition energies 3=6370
 Th²³², μ -mesic, 2P-1S transition, nuclear fission 3=8145
 Ti, μ -mesonic, X-ray transition energies 3=6370
 Tl, μ -mesonic, X-ray transition energies 3=6370
 Zn, μ^- decay anomaly 3=15312
 Zn, μ -mesonic, X-ray transition energies 3=6370

Attenuation

See Absorption.

Aurora

See also Airglow; Atmospheric spectra.

- absorption events, short duration 3=18561
 acoustic wave, excitation by electron streams 3=18528
 activity centre shift during mag. storm 3=3520
 activity development during magnetic storms 3=11469
 activity, effect on radio star scintillations 3=11603
 Antarctic auroral zone contraction, mag. storm effect 3=11452

Aurora — contd

- arc, height and position detm. method from one station 3=11449
 arc, 6300 A, obs. 3=11454
 arcs, stable, 6300 A, in mid-latitudes 3=23632
 artificial, from nuclear detonation, OI, N_2^+ emissions 3=13799
 Aurora Polaris, dynamical morphology 3=13801
 conference, Kyoto, 1961 3=15054
 disturbances, relation to ionosphere sporadic E and geomag. storms 3=18535
 and earth, magnetic field variations, giant 3=25956
 effects of trapped high-energy ions 3=23641
 electrojets rel. to electron precipitation with ionospheric current systems 3=1473
 electrojets, theory 3=18560
 electron bombardment and trapping meas. 3=13792
 electron-flux, intense, 1000 km, 25 Sept. 1961 3=1472
 electron precipitation, long period, and X-rays, hydromag. disturbances 3=23631
 electron precipitation, simultaneous, in northern and southern zones 3=23630
 electrons, penetrating, effects 3=13798
 electrostatic field generation and effect 3=18559
 e.m. backscattering, v.h.f., data analysis 3=9080
 e.m. wave absorption, rel. to trapped energetic electrons 3=13812
 e.m. wave propag. through 6300 A arcs 3=19460
 excitation, energetic particles prodn. in magnetosphere 3=3512
 5577A excitation, geomagnetic tubes, general properties 3=13800
 glows, rel. to high electronic temps. 3=9064
 green line, effect of SSC 3=11453
 h.f. radio fading and attenuation in auroral zone 3=5870
 at high latitude, 6300 and 5577 A lines 3=5223
 hydromagnetic theory and current systems 3=13842
 ionospheric drift theory 3=21066
 luminosity, assoc. with geomag. activity, ionospheric and telluric currents 3=13832
 luminosity rel. to simultaneous geomag. disturb. 3=23634
 motions, instantaneous, photoelectric tracking 3=3513
 N afterglow, metastable atoms 3=2570
 N_2^+ , prod. and loss processes 3=13787
 observations, Aug.-Sept. 1959, rel. to radiation belts 3=13817
 onset times, conjugate point relationship at high latitudes 3=13711
 particle bombardment studies in PCA events 3=13795
 plasma streaming in mag. dipole field, theory 3=16935
 polar, and electrojets, prodn. by charge-separation mechanism 3=1470
 polar, and lunar haloes, ionospheric diffr. mechanism 3=23629
 polar mesosphere, molecular oxygen
 dissociation 3=11450
 proton bombardment effects, meas. 3=13794
 quiet arcs, latitude limit, rel. to Dst (H) 3=6995
 radar echoes from ionization at 488, 944 Mc/s 3=21068
 radar observations during I.G.Y. 3=13806
 from radiation belt, outer, Cape Town anomaly 3=23640
 radiation point of auroral corona 3=11448
 radio meas., refl. mechanisms 3=13793
 radio signal absorption 3=510
 radio wave scatt., theory 3=11587
 ray structure, obs. 3=11451
 red arcs, latitude distrib. 3=18558
 reflection, electromagnetic waves, oblique, 90 Mc/s 3=25934-5
 reflection in v.h.f. band 3=13803-4
 solar plasma-geomag. field theory 3=13819
 telluric-current micropulsations, $T < 20$ seconds 3=18482
 temperature meas., using N_2^+ 3914 A band 3=9104
 theories, observational data, review 3=13797
 theory, bombardment, Chamberlain, criticism 3=6993
 theory, bombardment, Chamberlain, modification 3=6994
 v.h.f. backscatter, seasonal effects 3=18562
 X-rays, pulsating, 100 second period range 3=11455
 zenithal arc, thickness, over Fort Churchill, Canada 3=21065

Aurora — contd

- 1961, Oct. 28-29, and nightglow fluctuations 3=13802
 30 Mc/s absorpt. 3=13805

Avogadro's number

See Constants.

Balances

- for ferromagnetic films meas., automatic torque, sensitive 3=14707
 high-temperature, semimicro 3=5401
 micro, thermal transpiration disturbances 3=9399
 microbalance, helical tape, for use in high-vacua 3=21284
 microbalance, magnetic, modification 3=21283
 microbalance, null-reading, for adsorbed gases 3=21285
 microbalance, 2-component, for forces on ion-bombarded surfaces 3=23829
 recording electronically controlled balance 3=11367
 thermo, Stanton, modifications, to record wt. change and rate of change against temp. 3=9398
 torsion balance for anisotropy, magnetization meas. 3=19307
 torsion, for mag. meas. on particles 3=7872
 torsion microbalance for high-vacuum work 3=7166
 vacuum microbalance techniques, conference, Los Angeles (1962) 3=21281
 vacuum, ultra-high, micro-, quartz crystal 3=18774
 vibration isolating mounting 3=9397

Ballistics

See also Impact.

- launching tube for projectile motion expts 3=3777
 projectiles, horiz. and vert. components of motion demonstration of independence 3=14083
 rockets, long-range 3=1544
 shot peening, microcapacity measuring circuit 3=3976
 spring gun for demonstrations 3=5399
 vertical ballistic pendulum apparatus 3=23819

Barium

- adsorbed on W, effect on work function 3=14615
 adsorption on W, rel. to work function 3=18394
 atom, μ -mesic, 2P-1S transition energy 3=8218
 cathodes, sublimation, meas. technique and results 3=9830
 desorption from W by elec. fields 3=3360
 melting, polymorphism, high pressures 3=16834
 phase transformation, electronic, high pressure, calc. 3=23372
 plasma, production 3=392
 Ba⁺, desorption from Re 3=8930
 Ba II, resonance doublet shift and broadening rel. to He and A collisions 3=2562

Barium compounds

- ferrite, coercivity 3=15895
 ferrites, Ba and Sr mixed, magnetic energy, magnetization and coercive force 3=13279
 ferroelectricity, rel. to lattice dynamics 3=898
 Ba₂B¹B¹O₆ type, unit cells 3=16077
 BaB₂, semiconducting props. and electron requirements 3=8330
 Ba borate glasses, X-ray study 3=11269
 Ba borosilicate glass, radial distrib. 3=13483
 (Ba, Bi)FeO₃, dendrites, composition 3=3277
 BaCO₃, aragonite structure, out-of-plane bending of the CO₃ ion 3=25189
 Ba(ClO₃)₂.D₂O, deuteron mag. reson., quadrupole splitting 3=25589
 BaCo₂Fe_{13- γ} O₂₇, hexagonal, magnetocrystalline anisotropy 3=1029
 BaCrO₄, radiation damage effects 3=13016
 Ba cyanoplatinate, as γ -scintillator 3=6668
 BaF₂, colouration spectra 3=2837
 BaF₂, elastic and thermoelastic props. 3=18161
 BaF₂, electron spin resonance of Mn and Gd impurities 3=11111
 BaF₂, e.s.r. of U⁴⁺, charge compensation 3=3180
 BaF₂, growth of highly-perfect single crystals for masers 3=23397
 BaF₂, photoelasticity 3=916
 BaF₂, Raman spectrum 3=23065
 BaF₂, surface energy of {110} face 3=22632

Barium compounds — contd

- BaF₂, Er³⁺ and Yb³⁺ absorption and luminescence spectra 3=3000
 BaF₂, Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
 BaF₂: Sm²⁺, luminescence kinetics 3=4986
 BaF₂, U-activated, luminescence, "relaxation spectra" 3=3035
 BaFe_{12-2x}Ir_xZn_xO₁₉, linewidth, rel. to composition 3=15878
 BaFe₁₁O₁₉, ferromag. domains, microscopy 3=20589
 BaFe₁₁O₁₉, ferromagnetic resonance 3=20634
 BaFe₁₁O₁₉, mag. nucleation near dislocations 3=5009
 BaFe₁₁O₁₉, magnetic anisotropy, effect of F-compensated Co³⁺ 3=15877
 BaFe₁₁O₁₉ thin layers, domain width rel. to temp. 3=1014
 Ba ferrite, high-coercivity state 3=11094
 Ba ferrite, powder, single-domain magnetic props. 3=15880
 Ba ferrite powders, coercive force, effect of particle size 3=15879
 BaGeO₃, crystal structure at high temp. 3=1300
 Ba₂Mg₁₇, crystal structure 3=20837
 Ba₂Mg₁₇, crystal structure, atomic, and Mg substitution solution on superlattice 3=20838
 Ba(NO₃)₂, elastic and thermoelastic props. 3=18161
 BaN₆ u.v., spectral and photoelec. props. 3=25450
 Ba(NiW)₆O₆, phase transitions 3=8864
 BaO, adsorption on Ni films, effect on elec. resist. 3=20271
 BaO, (BaSr)O, cathodes, thermoelectric power, and conductivities 3=17969
 BaO, cathodes, sublimation, meas. technique and results 3=9830
 BaO, microwave spectrum 3=17570
 BaO molecular beam, interaction with W incandescent surface 3=23541
 BaO on nickel core, thermoelec. power 3=25426
 BaO, as possible molecular beam frequency standard 3=12882
 BaO, sublimation, and W, work function, changes 3=19294
 BaO, thermionic emission on doping with rare earths 3=422
 BaO, work function, films, on W, var. with temp. and deposition time 3=19296
 BaO, work function, films, on W, var. with temp. and deposition time 3=19297
 Ba(OH)₂.8H₂O, OH bond orientation 3=4968
 Ba_{0.97}Pb_{0.03}TiO₃, anomalous polarization and discharge currents 3=13120
 BaS, dielec. props. at 7.25 Mc/s 3=17932
 BaSO₄, barite, crystal structure 3=13471
 BaSO₄, crystallization, in aqueous solution 3=16040
 Ba_{1-x}Sr_x0.6Fe₂O₃, mag. props., texture effects 3=20615
 Ba_{0.93}Sr_{0.07}TiO₃, ceramic, rejuvenation 3=8561
 (Ba_xSr_{1-x})TiO₃, dielec. and electrocaloric props. 3=2957
 BaTiO₃ ceramic, ferroelec. props., neutron effects 3=896
 BaTiO₃ ceramics, for fine movement control 3=7418
 BaTiO₃ ceramics, resistance, elec., temp. var., anomalous, intergranular barrier model 3=25399
 BaTiO₃ circular disk, vibrations 3=20389
 BaTiO₃, coercive field rel. to thickness 3=20381
 BaTiO₃, compensation of ferric ions in lattice 3=11196
 BaTiO₃, crystal structure, refinement 3=1331
 BaTiO₃ crystals, polarization reversal 3=13114
 BaTiO₃, cubic-tetragonal phase transform. 3=20769
 BaTiO₃, cubic-tetragonal transition, nucleation 3=4942
 BaTiO₃, cubic-tetragonal transition 3=6816
 BaTiO₃, dielectric breakdown 3=2962
 BaTiO₃, dielectric const. rel. to temp. 3=4945
 BaTiO₃, domain conversion 3=13115
 BaTiO₃, domain orientation, rel. to mechanical load 3=22995
 BaTiO₃, domain structure and unknown streak in electron diffraction pattern 3=1287
 BaTiO₃, doped, Hall effect and elec. cond., temp. depend. 3=8515
 BaTiO₃, double space charge injection 3=13128
 BaTiO₃, effect on props. of MnO₂, doping 3=8560
 BaTiO₃, electric strength, temp. variation 3=15619
 BaTiO₃, ferroelectric Curie point reduction at high pressures 3=22994
 BaTiO₃, ferroelectric domain obs., by electron microscopy 3=13113

Barium compounds — contd

- BaTiO₃, ferroelectric props., Co addition effects 3=22996
 BaTiO₃, ferroelectric studies by neutron diffraction 3=899
 BaTiO₃, films, monocrystalline, prep. method 3=2954
 BaTiO₃, force consts. from i.r. spectrum 3=25180
 BaTiO₃, hillocks prod. by etching 3=11220
 BaTiO₃, microprobe, u.s. fields meas. 3=1777
 BaTiO₃, microwave dielec. dispersion, mechanism 3=25398
 BaTiO₃, 90° and 180° domain interaction 3=2952
 BaTiO₃, 90° domain walls 3=10878
 BaTiO₃, paramagnetic particles, e.s.r. 3=15935
 BaTiO₃, polycrystalline, Δε anomalous delay effect 3=15617
 BaTiO₃, powder, ceramic, crystal, dielec. loss 3=894
 BaTiO₃, phase transition, ferroelec. nucleation 3=4943
 BaTiO₃, refractive index, temp. var. 3=10903
 BaTiO₃, secondary piezoresistivity 3=10879
 BaTiO₃, single-crystal domain structure, BaTiO₃, structure rel. to hydrostatic pressure up to 600 kg cm⁻² 3=3302
 BaTiO₃, structure rel. to hydrostatic pressure up to 600 kg cm⁻² 3=6848
 BaTiO₃, switching time, thickness depend. 3=4944
 BaTiO₃, temp. depend. of breakdown field 3=4948
 BaTiO₃, tetragonal to cubic transform., effect of grain size 3=8792
 BaTiO₃, thermal expansion and pyroelectricity 3=12929
 BaTiO₃, thickness-mode resonator 3=7266
 BaTiO₃ transducer, electromech. impedance 3=9555
 BaTiO₃, twinning, 2 types, by hot C replica technique 3=18409
 BaTiO₃-BaHfO₃, piezoelectric moduli 3=17939
 BaTiO₃, BaTiO₃(70%)SrTiO₃(30%), spectrum, i.r., 670-15 cm⁻¹, absorpt. 3=23064
 BaTiO₃, Ti X-ray spectra, emission, bond type and Kβ, line changes 3=23092
 BaTiO₃ + (ZrO₂, MgO), e.s.r. 3=15935
 BaTiO₃, Raman spectrum 3=17995
 BaTiS₂, synthesis and crystal structure 3=8850
 Ba₂ZrAs₂O₈, luminesc. and crystal structure 3=10982
 Ba₂ZrP₂O₈, luminesc. and crystal structure 3=10982
 BaZrS₂, synthesis and crystal structure 3=8850
- Baryons**
 See also Hyperons; Nucleons and antinucleons.
 antibaryons, annihilation 3=10067
 baryon-baryon scatt., parity conservation 3=19552
 baryon-meson resonances, mass formula 3=24782
 baryon-meson mass spectrum 3=7787
 baryonium annihilation into meson + vector meson 3=14883
 bayrons and resonances, internal degrees and mass quantization 3=22065
 bilinear invariant in n-dim. spinor theory 3=5922
 boson-baryon scatt., Sawada transform. appl. 3=19580
 charge, in octet model of strong interact. 3=7785
 charged currents, Lagrangian construction, dominant |ΔI| = 1/2 3=22069
 compound model with strangeness 3=17173
 in cosmic ray jets, secondaries 3=4543
 in cosmic ray secondaries, rel. to no. of nuclear-active particles 3=2340
 decay interaction 3=10068
 density in universe, upper limit 3=1507
 eightfold-way assignments, in four unitary-multiplet Regge trajectories 3=15040
 eightfold way, baryon-baryon interactions 3=24604
 field theory, generalized, for spin and charge states 3=2460
 interaction with grav. and e.m. field, in Rayski manifold 3=4334
 interaction with nonvanishing mass, via a vector field 3=3528
 interactions with baryons and antibaryons, rel. to SU₃ symm. 3=24612
 interactions with bosons, doublet theory 3=17184
 and leptonic isospin 3=14877
 mag. moment, from unitary symmetry elementary particle model 3=12396
 mass differences, rel. to weak boson coupling 3=10026

Baryons — contd

- mass spectra 3=5933
- mass spectrum, by nonlinear field theory 3=22056
- mass spectrum structure, parity class and equivalence principle 3=19554
- meson-baryon pseudoscalar $P_{3/2}$ analysis 3=17296
- mesons as bound states of antibaryon-baryon pairs 3=7871
- neutral currents, rel. to hyperon single production 3=6085
- ω -baryon coupling const., calc 3=24627
- relation for masses 3=17188
- from resonance decays, relative weights, in broken-symmetry theories 3=22073
- resonances, as baryons; pseudoscalar mesons systems 3=2192
- resonances with mesons, isotopic-spin-zero 3=10040
- resonances, in $\pi^- + N \rightarrow K^0(K^*) + Y(K, N) + m\pi$, 2.8 BeV/c 3=17315
- resonances, tenfold assignment 3=14927
- self-energies, fourth-order contrib., and mass spectrum 3=537
- spin and parity, meas., for isobars, from decay 3=19597
- strong interactions, new symmetry replacing strangeness 3=5931-2
- theory as alternative fermion state to leptons 3=22061
- theory, in 3-dimensional isospin, with elementary resonance requirements 3=17294
- theory, many mass- and spin-states described simultaneously 3=24602
- $\frac{3}{2}^-$ octet of N^* , Y^* , Y^{**} and Ξ^* 3=10173
- two-baryon interactions, elastic 3=10060
- weak interactions with pions, theory 3=24619
- KK reson., 1019 MeV, spin and parity 3=17336
- $\bar{p}p \rightarrow \bar{B}B$, 3 GeV/c 3=17280
- in ν -N absorption, zero total strangeness 3=4377

Bells

See Musical instruments.

Bending

See also Stress analysis; Torsion.

- buckling, plates, rectangular orthotropic, analogy with vibration 3=16676
- buckling of rect. orthotropic plates 3=85
- ice, grain boundary motion 3=6527
- length bar with end load, flexure 3=7152
- sapphire rods, strength, effect of flame polishing 3=8780
- shells, instability, local, bulging, under pressure 3=5394
- shells, meas. by interference, analysis 3=7153
- stiffness, elastic, rel. to internal stresses 3=7157
- III-V cpds., thin wafers, spontaneous bending 3=3219
- Cu, dislocations, etch pit study 3=2808
- InSb, thin wafers, spontaneous bending theory 3=3219
- SiC single crystal platelets, crossbending strength 3=20708
- TiC-WC-Co, tensile stress 3=3316

Berkelium

No entries this year

Beryllium

- abundance in solar atmosphere 3=13881
- atom, generalized product functions 3=10449
- atom, neutral, spectrum 2050-18200 Å 3=2563
- atom, photoelec. K-absorpt. cross-section 3=6350
- atoms, electron pairs 3=12754
- atoms, ground-state energy, calc. from Hylleras wave-function 3=10450
- band structure and e^+ annihilation in 3=6503
- Be^{3+} , 2^3S state, 20-parameter calc. 3=2561
- Be^7 , atmospheric content. 3=25903
- crystals, gas bubbles at grain boundaries, rel. to irradiat. 3=8471
- dislocation configs. and microstrain, annealing effect 3=20190
- ductility, in tension, 20-500°C 3=3220
- elec. cond., temp. depend. 3=3297
- etch pits at dislocations, obs. 3=17755
- fallout, Be^7 , rain and air, and Cs^{137} , var. 3=25904
- Fermi surface 3=8401
- Fermi surface models, cyclotron resonance 3=8413
- fracture, in tension, 20-500°C 3=3220
- impurity solubility 3=25272
- ions, Be^{2+} , S-states, variational calc. 3=22471
- ions, Be^8 , range in Al and Au, at 2-21 MeV 3=2048

Beryllium — contd

- K-emission bands meas. 3=8605
- lattice dynamics, slow-neutron study 3=747
- lattice parameters, temp. depend. 3=3297
- lattice vibr. spectrum from elastic consts. 3=10578
- neutron scatt., cold, anisotropy 3=4823
- neutrons, thermal, diffusion, 100°K, corrections 3=10124
- orthogonalized plane wave form factors 3=25229
- photoelectric emission, by X-rays, 0.28-9 keV, on films, effective depth 3=21864
- photoelectric yield 3000-250 Å 3=21865
- polymorphism, 1254°C 3=3297
- secondary electron emission, 1 MeV proton bombardment 3=24344
- solubility of Ti, Zr, Y, Ni, O_2 and N_2 in quenched samples 3=20908
- spin-orbit coupling in electron band structure 3=10626
- thermal expansion, temp. depend. 3=3297
- whiskers, production and orientation on Mo 3=18278
- X-ray absorption spectrum, ultrasoft region 3=4232
- X-ray emission spectrum, valence band 3=8606

Beryllium compounds

- alloys, superconductivity 3=16873
- beryl, optical props. and vibr. frequ. 3=10905
- beryl ($Be_3Al_2Si_5O_{18}$), growth of single crystals for micro-wave appl. 3=1264
- beryllides, crystal unit-cell volumes, rel. to components 3=23446
- $BeAl_2O_4$: Cr, luminescence kinetics 3=20511
- Be-BeO-Au thin film, tunnelling structure 3=13069
- $BeCl_2$, aq. soln., polymerization meas. 3=9463
- BeF_2 , aq. soln., polymerization meas. 3=9463
- Be-Fe alloys, phase transforms. 3=11290
- BeO, cathodoluminescence, vacuum u.v. 3=13178
- BeO, conductivity, thermal from axial temp. distrib., -200 to +150°C 3=12932
- BeO crystals, polar character 3=10884
- BeO, defect configurations rel. to heavy-atom bombardment 3=22865
- BeO, defects due to neutron irradiation 3=8426
- BeO, elastic consts. at room temp. 3=5057
- BeO films, current flow, mechanism 3=22976
- BeO, high temp. phase inversion 3=1320
- BeO, hot pressed, texture 3=25648
- BeO, inelastic neutron scatt. and Debye temp. 3=12911
- BeO, irradiated, He diffusion after annealing from specific heat, below 4°K 3=15509
- BeO, irradiated, internal stresses, by X-ray diffraction 3=6550
- BeO, irradi., neutron diffrn. exam. 3=3289
- BeO, irradiated, stored energy, by calorimetry 3=9648
- BeO layers, external photoeffect, and secondary electron emission 3=24337
- BeO, luminescence, electron excitation 3=15717
- BeO mol., $(B^2\Sigma^+-X^1\Sigma^+)$ system, transition probabs. 3=8249
- BeO, neutron irradi., structural changes 3=18298
- BeO, neutron-irradiation damage 3=20255
- BeO, neutron scatt., 5-6 Å, 100-400°K, calc., one and two-phonon processes 3=20099
- BeO, neutron scatt., rel. to temp. and micro-struct. 3=4403
- BeO sintering 3=18368
- BeO, sub-crystal formation, high temps. 3=2818
- BeO, thermodynamic props. 298°-1200°K 3=25196
- BeO, vacancy defects, rel. to I and Kr bombardment 3=8419
- BeO-CaO mixture, heat of fusion 3=293
- BeO-Li₂O mixture, heat of fusion 3=293

Beta-decay theory

See also Nuclear decay theory.

- $[\bar{\alpha}/i]/\bar{r}$, evaluations 3=6195
- anomalous shape in allowed spectra, strong interact. effects 3=2400
- atomic overlap and electron exchange effects 3=10283
- axial const. renormalization 3=12618
- beta-gamma emission through virtual states 3=2402
- $\beta-\gamma-\gamma$ ang. correl., time reversal test 3=10033
- bremsstrahlung, internal, Coulomb corrections 3=15130
- conserved vector current, test by β spectra of B^{12} , N^{12} 3=15137

Beta-decay theory — contd

- conserved vector current, test by Li^8 decay 3=12619
 conserved vector current theory, test 3=10285
 Coulomb beta-transitions, second forbidden 3=8028
 coupling consts. rel. to composite pion model 3=24588
 electron capture, M/L ratios, effect of exchange 3=22324
 energy conservation, apparent violations rel. to
 neutrino degeneracy 3=3533
 using exact electron radial wave functions 3=8029
 excitation of O^+ states of even-even nuclei 3=22322
 finite nuclear size effects 3=646
 first-forbidden, β - γ circ. polarization corrs. 3=2401
 forbidden transitions, screening effect 3=8027
 G-conserving terms, existence 3=17425
 internal pair emission from aligned nuclei 3=19807
 Langer effect, rel. to lepton coupling theory 3=22061
 light nuclei, generalized model 3=19808
 matrix elements, pairing corrs. of supercond. type 3=12639
 near closed shells, rel. to pairing correlations 3=6196
 neutrino role, rel. to that in π -decay 3=24687
 neutron, muon and O^{14} , radiative corrections 3=12404
 neutrons, radiative corrections 3=24735
 nucleon ("bare"), appl. of ξ -limiting process 3=553
 pairing correlation effects 3=19802
 pion cloud collective motion, effects 3=19553
 pion, vector form factor 3=19666
 positron decay, proton emission, retarded, in light
 nuclei with neutron shortage 3=6197
 radiative corrections to processes mediated by vector
 bosons 3=2228
 shape of allowed β -spectra, correctn. 3=10282
 strongly-deformed nuclei, matrix elements of
 allowed β -transitions 3=2399
 transition probabilities, on "superfluid nuclear
 model" 3=10207
 universal weak interact. theory, form factors 3=24625
 vector coupling constant, renormalization 3=24761
 vector interactions for forbidden transitions 3=22323
 vector transitions, extensions of Siegert theorem 3=4588
 Ar^{37} , 1S orbital electron capture, radiative 3=4589
 Ir^{192} , matrix elements 3=12645
 A, current-current type of interact. 3=7928
 O^{14} , matrix element, Coulomb effects 3=647
 O^{16} , monopole pairs correl., radiative corrections 3=19810
 Pm^{144} , matrix elements 3=8043
 Pr^{144} , shape factor 3=12632
 $\text{Rb}^{84} \rightarrow \text{Kr}^{84}$ 3=17435
 $\text{Rb}^{86} \rightarrow \text{Sr}^{86}$ 3=17435
 Re^{186} , first forbidden conserved vector current
 theory 3=22309
 Re^{186} , first forbidden conserved vector current
 theory 3=22309
 Sc^{50} 3=7992
 Tm^{170} , first forbidden, conserved vector current
 theory 3=22309
 Y^{90} , first forbidden, internal bremsstrahlung, circular
 polarization, calc. 3=22332

Beta-ray spectra

See also Nuclear decay theory.

- allowed, correction to shape 3=10282
 average energy meas. 3=19153
 β -decay, β - γ circ. polarization corrs. 3=2401
 beta-decay total energies, isobaric analysis 3=17426
 rel. to electron polarization, β -decay theory 3=8029
 forbidden transitions, screening effect 3=8027
 odd-A nuclei ($151 \leq A \leq 191$), conversion electrons 3=2380
 pure β -emitters, identification 3=12607
 A^{41} , shape 3=6202
 Ag^{110} decay to Cd^{110} , conversion electrons 3=24898
 Ag^{110} , search for β^+ 3=6206
 $\text{Ag}^{110m,111}$ 3=22401
 Ag^{112} 3=650
 Al^{24} , circular polarization 3=17428
 As^{70} 3=12624
 Au^{198} 3=2418
 Au^{198} , conversion electrons 3=10274
 Au^{198} , K-conversion coeffs. 3=656
 B^{11} , 2-13 MeV state 3=7986
 B^{12} , comparison with N^{13} 3=10285

Beta-ray spectra—contd

- B^{12} and $\text{N}^{13} \rightarrow \text{C}^{12}$, test of conserved vector current
 theory 3=15137
 B^{12} rel. to C^{12} 3=4358
 Ba^{140} , from γ -ray spectra 3=8039
 Br^{75} , β^+ spectra 3=2407
 Br^{83} 3=19817
 C^{12} rel. to B^{12} 3=4358
 Cd^{114} , from $\text{Cd}^{113}(\text{n}, \gamma)$, internal conversion, 20-3000 keV
 and Cd^{114} levels 3=24959
 Cd^{115m} 3=17438
 Co^{55} β - γ correl. 3=6192
 Co^{57} decay, and Fe^{57} , 14.4 keV internal conversion 3=19814
 Co^{58} , positrons, shape factor anal. 3=19815
 Co^{60} decay in Co-Fe alloy, anisotropy 3=4590
 Cr^{55} 3=22329
 Cs^{133} , end-point energy of β^+ spectrum 3=10295
 Dy^{157} 3=22342
 Dy^{165} 3=655
 $\text{Er}^{150,161}$, conversion electrons 3=10308
 Er^{159} decay 3=4597
 Er^{165} , electron capture decay to Ho^{165} 3=2415
 Er^{166} , conversion electron, from Tm^{166} decay 3=8049
 Er^{166} , conversion electrons 3=10269
 Eu^{158} 3=10299
 Eu^{150} 3=19822
 F^{20} decay, β - γ correl. 3=6203
 Fe^{59} 3=17430
 Ga^{66} , $0^+ \rightarrow 0^+$ positron spectrum, shape 3=8046
 Gd^{153} , populated by Eu^{153} decay 3=17417
 Gd^{158} decay, β - γ coincidences 3=22340
 He^6 decay 3=614
 Hf isotopes 3=8051
 $\text{Hf}^{171,173}$, conversion, 30-350 keV 3=8050
 Hg^{203} , K- and L-conversion 3=10314
 Ho , internal conversion 3=6208
 Ho^{165} , conversion electrons 3=15120
 I^{132} , internal conversion electrons 3=22335
 I^{132} , internal conversion study 3=2409
 In^{114} , anomalous spectrum 3=10290
 In^{114} polarized, Fe alloy, asymmetry 3=2417
 Ir^{186} , positron spectrum 3=10313
 Ir^{192} , polarized, Fe alloy, asymmetry 3=2417
 Lu^{176m} 3=8010
 Lu^{179} 3=10311
 Mg^{27} 3=2405
 Mg^{27} 3=6199
 Mn^{56} 3=4592
 Mn^{56} decay, β - γ correl. 3=6203
 Mn^{56} and β - γ coincidences 3=8032
 N^{12} and $\text{B}^{12} \rightarrow \text{C}^{12}$, test of conserved vector current
 theory 3=15137
 N^{12} , comparison with B^{12} 3=10285
 Na^{24} , circular polarization 3=17428
 Nd^{139} , β^+ 3=10303
 Ni^{65} β - γ correl. 3=6192
 O^{16} inelastic scatt. of electrons 3=19836
 $\text{Os}^{181,181m}$ 3=10312
 P^{32} decay, deviations from allowed form 3=6201
 Pa^{234} , β - and internal-conversion electrons 3=2395
 Pa^{233} , internal conversion and β -ray 3=10318
 Pb^{211} 3=10315
 Pb foil, X-irrad., 320 kV 3=12241
 Pm^{148} 3=8043
 Pm^{181} , internal conversion 3=12634
 Pm^{153} 3=4595
 Pr^{144} and level spins, from β - γ correl. 3=22308
 Pr^{144} , circular polarization and β - γ correl., and
 spin 3=22270
 Pt^{190} 3=8016
 Pt isotopes, neutron deficient, conversion 3=8053
 Pt isotopes, n-deficient, conversion electrons 3=8052
 Ra^{226} , conversion, from Th^{226} decay 3=8056
 Re^{182} , positron decay 3=22347
 Re^{184} decay, e^+ , e^- , conversion, from W + d,
 13.6 MeV 3=24910
 Re^{184} , internal conversion 3=10271
 Re^{186} , polarized, Fe alloy asymmetry 3=2417
 Rh^{97} decay 3=2408

Beta-ray spectra—contd

- Sb^{113,115}, β^+ 3=10291
 Sc⁴⁴ 3=10288
 Se⁸³, β - γ correl. 3=6192
 Sm¹⁵⁰, thermal neutron capture 3=15118
 Sm¹⁵⁵ 3=12635
 Sm¹⁵⁹ 3=17442
 Sn¹¹³, β^+ 3=10291
 Ta isotopes, neutron deficient 3=8051
 Tb^{148,150,152}, β^+ 3=10303
 Tb¹⁵³, conversion, and positrons 3=10304
 Tb¹⁵⁹, conversion electrons 3=15120
 Tb¹⁶¹ 3=12636
 Te¹²¹ 3=10293
 Th²³⁴, 24 day 3=15158
 Tl²⁰⁰, K - conversion coeffs. 3=656
 Tm¹⁶², conversion, β^+ 3=22345
 Tm¹⁶⁹, conversion electrons 3=15120
 Tm¹⁷⁰, K conversion coeffs. 3=656
 U¹³² 3=4581
 V⁴⁷, β - γ correl. 3=6192
 V⁴⁸ 3=19812
 V⁵² 3=22329
 W isotopes, n-deficient, conversion electrons 3=8052
 Xe¹³¹ 3=10294
 Xe¹³¹, low energy internal conversion 3=651
 Y⁸⁸, positron decay 3=6205
 Yb¹⁶², conversion, β^+ 3=22345
 Zn⁶⁹ 3=2418

Beta-ray spectrometers

- aberration, "spherical", reduced by azimuthally-varying fields 3=19615
 anomalous focusing for weak spectra 3=2414
 automatic, prism-type, using magnetic alloy 3=10093
 Chalk River, iron-free, radial focusing aberrations 3=24365
 control system, automatic 3=24703
 double focusing, for conversion electrons from (n, γ) reactions 3=2245
 double focusing, optimum performance 3=4378
 electron-electron coinc., for short lifetimes 3=14962
 electron optics, time of flight and image rotation 3=14658
 using emulsions 3=17252
 focusing in mag. field proportional to r^{-1} 3=9865
 for high energy beta decays 3=580
 intermediate-image, for electron scatt. expts. 3=5986
 for internal conversion electrons, from (n, γ) reactions 3=7831
 internal pair 3=14966
 longitudinal magnetic, with intermed. image few keV to 2.5 MeV range 3=24701
 $\pi \sqrt{2}$ precision iron-free, 35 cm optic circle radius 3=24702
 luminosity, large 3=19614
 magnetic prism spectrometer, electron-optical system and construction 3=19363
 magnetic prism spectrometer, resolving power, effective aperture, accuracy 3=19364
 use of plastic scintillators 3=2247
 positron detection 3=19617
 positron, scintillation, 4π 3=7838
 scintillation, coincidence-type, background 3=17251
 sector, double focusing 3=17253
 Siegbahn—Slätis, use of scintillation detector 3=14964
 six-gap type, magnetic system 3=17250
 solenoidal, for (e, γ) coincidence expts. 3=14963
 solid-state detectors 3=19616
 source prep., e.m. separation method 3=12608
 trajectory calc. on computer, rel. to magnetic lens focusing 3=19342
 with two-fold $\pi\sqrt{2}$ focusing 3=7832
 $2 \times \pi\sqrt{2}$, double focusing 3=2246
 vacuum depend. of transmission, resolving power 3=10095

Beta-rays

- See also Electrons.
 source, liquid, thin, for β - γ correlation studies 3=10094
 β - γ coincidence methods of radio-isotope determination 3=15123
 β - γ coincidences, technique to analyse
 Zr⁹⁵—Nb⁹⁵, Ru¹⁰³—Ru¹⁰⁶ pairs 3=5990

Beta-rays — contd

- beta-gamma emission through virtual states 3=2402
 Ag¹¹⁰, 24 sec, branching ratio 3=22333
 Ag^{110m}—Cd¹¹⁰, decay scheme and matrix elements 3=8038
 Ag¹¹², β - γ coincidences 3=650
 Au¹⁹⁹, e.m. transition probabs 3=12642
 B¹², half-life and ft value 3=15139
 B¹² 3=22326
 B¹², ft values for decay to C¹² 3=10284
 Ba¹⁴⁰, β - γ coincidences 3=8039
 Bi²⁰⁸, monoenergetic positron line 3=12603
 Br⁸¹, β - γ coincidences 3=2406
 Ca⁴⁵, internal bremsstrahlung spectrum 3=22327
 Cd¹¹⁵, 2.3 day, decay 3=17437
 Ce¹⁴⁴, β - γ coincidence 3=8041
 Cm²⁴⁴, 1042 keV state decay 3=22314
 Co⁵⁸, effects on nuclear alignment 3=17433
 Co⁶⁰ source standardization for β - γ coincidences 3=7822
 Co^{60m} 3=17432
 Cs fraction decay from U proton fission 3=24995
 Cs¹³⁴ 3=24903
 Eu^{152,154}, matrix element and yield 3=24900
 Dy^{153,156,157} decay, conversion electron coincidences 3=8047
 Eu¹⁵⁵, β - γ coincidence 3=8041
 Eu¹⁵⁶, β - γ coincidences 3=10299
 Eu¹⁴⁷, conversion spectrum, 750-1100 keV 3=10298
 Eu¹⁴⁸, e- γ , β^+ - γ coincidences 3=15117
 Eu¹⁵², first-forbidden, nuclear matrix elements 3=2412
 Eu^{152m} decay, γ β correlation 3=15085
 Fe⁵⁹ 3=17430
 He⁶, electron loss after β^- decay 3=10182-3
 Ho¹⁶⁰ \rightarrow Dy¹⁶⁰ decay, conversion electron coincidences 3=15154
 In^{116g} \rightarrow Sn¹¹⁶, 1.72 MeV level transition 3=4568
 La¹⁴⁰, first-forbidden matrix elements 3=24904
 Li⁷(γ ,2p)H³ 3=12620
 Lu¹⁸⁰ + Lu¹⁷⁰, conversion spectrum, 1020-3200 keV, from Ta + p 3=12641
 Lu¹⁷², conversion spectrum, 1020-3200 keV, from Ta + p 3=12641
 Mg²⁷, β - γ coincidences 3=2405
 Mg²⁷, β - γ coincidences 3=6199
 Mo⁹⁹, β - γ coincidences 3=8037
 N¹², ft values for decay to C¹² 3=10284
 N¹², half-life and ft value 3=15139
 Ne²³, electron shake-off, Na ions meas. 3=15141
 Ni⁵⁹ decay, K-capture interference, through virtual state 3=19816
 O¹⁴, theory, radiative corrections 3=12404
 Pm¹⁴⁷, longitudinal polarization meas. 3=653
 Pm^{148,148m}, β - γ , e- γ coincidences 3=15116
 Pm¹⁵¹, e-e, e- β , e- γ , β - γ coincidences 3=8042
 Po²¹⁰, α -decay, M photon yield meas. 3=15156
 Pr¹⁴⁰, conversion electron spectrum 3=17415
 Pt¹⁹⁷ \rightarrow Au¹⁹⁷, γ -ray spectrometry 3=24913
 Pt¹⁹⁹ decay, β - γ coincidence and Au¹⁹⁹ low levels 3=17422
 Pt¹⁹⁹, e- γ coincidences 3=8053
 Re¹⁸², positron decay 3=22347
 Rh¹⁰⁶, isomeric state 3=15146
 Rh¹⁰⁶, population of Pd¹⁰⁶ 3=17410
 Ru⁹⁵, γ coincidence, modified decay scheme 3=19818
 Sb¹²³, matrix elements of 1.40 MeV transition 3=10292
 Sb¹²⁴, matrix element and yield 3=24900
 Sc^{43m}, positrons 3=10257
 Tb¹⁵⁰, conversion, from Dy¹⁵³ decay, coincidences 3=17443
 Tb¹⁶¹, energy 3=12636
 Tb¹⁵¹, 25-min, gamma-ray spectra 3=22334
 U²³⁵, fission products, chain length 3=2510
 Y⁹⁰ decay, energy and bremsstrahlung 3=12626
 Zn⁷², β - γ coincidences 3=24896
 Zn⁷² 3=8035
 Zr^{90m} 3=17432

absorption

- See also Electrons, absorption.
 β^- , self-absorpt. and back-scatt. 3=24693
 backscattering by thick absorbers meas. 3=22109
 in Si, range-energy relationship 3=17113

Beta-rays—contd

angular distribution

- β - γ correl., rel. to 2^+ states structure 3=7984
- Λ decay, e-p ang. correls. 3=7928
- Eu^{152} , β - γ correl. 3=2412
- $\text{Eu}^{152,154}$, β - γ correl., anisotropy factor 3=24900
- Ga^{62} , K conversion, rel. to 344 keV γ -transition 3=17417
- La^{140} , β - γ correl. 3=24904
- Li^8 , β - α ang. correl. 3=12619
- Li^8 , β - α , anisotropy meas. 3=24891
- Ne^{19} polarized, asymmetry and mag. moment 3=17427
- O^{16} , monopole pairs correl., radiative correction 3=19810
- Pr^{144} ground state, β decay, β - γ directional correl., energy depend. 3=19753
- Pt^{192} , de-excitation, \bar{e} - γ ang. correls. 3=6181
- Re^{188} , β - γ directional correl. 3=4600
- Re^{188} , β - γ directional correl. 3=4601
- Sb^{124} , β - γ correl., anisotropy factor 3=24900
- Sb^{124} , β - γ directional correl. 3=24901
- Sc^{46} , β - γ circ. polarization correl. 3=15142
- Sc^{46} , β - γ circ. polarization correl. 3=22328
- Tm^{170} , β - γ directional correl. 3=4600
- Y^{91} , e- ν ang. correl. in β -decay 3=8036

detection, measurement

- See also Beta-ray spectrometers; Dosimetry; Particle detectors; Radioactivity measurement.
- α -emitters, counter sensitivity to γ and conversion spectra 3=22110
- β - γ coincidence method, dead-time correction 3=4584
- Cherenkov counter, threshold gas type 3=14825
- chromatogram layer with gel scintillator 3=24705
- counter, anticoincidence, for tropical conditions 3=7416
- counter, proportional, gas cell, for weak betas 3=5900
- counter, proportional, for radiocarbon dating 3=7829
- counter, scintillation, Pb sandwich, 1-10 GeV 3=17105
- counters, continuous flow, methane, response efficiency 3=7741
- counters, scintillation, organic, difference from α pulses 3=17103
- emulsion radiograms, quantitative, possibilities 3=17158
- Fricke dosimeter, oxidation efficiency for P^{32} 3=7830
- Geiger counter, air-filled 3=4175
- Geiger-Müller counter, thin-walled, cylindrical 3=579
- liquid scintillation counter, absolute activity meas. by extrapolation method 3=24700
- low-energy, by liquid scintillators 3=5991
- low-energy, methods 3=24704
- luminescence chamber, for low levels and γ -discrim., several liquids 3=19533
- parallel plate halogen counter 3=12370
- scintillation counter for ag. solns. meas. 3=6185
- scintillation counters for β -spectroscopy 3=24883
- scintillation counters, low-level, automatic 3=24553
- scintillation spectrometry, internal source 3=24547
- showers, spark chamber detection efficiency 3=17141
- solid-state detectors 3=19616
- surface active area depiction, by luminescence 3=6189
- vice-configuration scintillation counter 3=22037
- Au^{198} solution, absolute 3=22349
- NaI:Tl crystal, large, 55-83 MeV 3=14965
- Si junction detector, internal conversion electrons 3=2930
- Si surface-barrier diodes 3=22041

effects

- See also Electron beams, effects; Nuclear reactions, electrons.
- anthracene, luminescence excitation 3=11005
- hydrocarbon gases, ionization, H isotope effect 3=19171-2
- paraffin wax, electrets prep. 3=8566
- racemates and antipodes, optical activity rel. to electron irradiation, from different sources 3=2996
- CH_3^{130} and $\text{C}_2\text{H}_5^{131}$, Xe-hydrocarbon ions resulting from nuclear decay 3=16183
- Cu, cascades, up to 400 MeV 3=22369
- KCl, electrification of dust from 3=902
- LiF , absorption and reflectivity spectra, vacuum u.v. 3=13178
- Pb, cascades, up to 400 MeV 3=22369
- Zn, stress/strain curves 3=18174
- Zn, tensile strength 3=8781

Beta-rays—contd

scattering

- See also Electrons, scattering.
- β^- , back-scatt. and self-absorpt. 3=24693
- backscatt., det. of component in binary alloys 3=11278
- back-scatt. gauge to meas. thickness of coatings 3=23827
- backscattering by thick absorbers meas. 3=22109
- backscattering in scintillation detector 3=14964
- on electrons, effect of inelastic processes 3=24697
- on positrons, effect of inelastic processes 3=24697

Betatron

- See Particle accelerators, orbital.

Bibliographies

- airglow, oxygen green line 3=13790
- alloys, ordering, strain ageing 3=8775
- atmosphere, upper, excitation of He 3=13789
- atmospheric i.r. transmission 3=3468
- atmospheric phenomena and instrum. optics 3=3509
- atmospheric tracers and general circulation 3=23587
- atomic transition probabilities 3=2547
- aurorae and penetrating electrons 3=13798
- auroral theories, observational data 3=13787
- boiling, nucleate, analysis 3=7382
- boundary layers, turbulent, heat transfer 3=11968
- ceramics, cryst., fracture mechanisms 3=23356
- ceramics, polycryst., mech. behaviour 3=23357
- chemical reaction rate theory, physico-mathematical foundations 3=3382
- clean surfaces prod. in high vacuum 3=23499
- cosmic gamma-rays at high energies 3=7944
- cosmic-ray C^{14} prod. by neutrons, theory 3=17378
- coupled waveguides theory 3=24471
- crystal counters, homogeneous 3=2165
- d.c. cond. of macromolec. substances 3=20367
- daltonides, semiconductivity criterion 3=10762
- diatomic mols., electronic transitions 3=15335
- dielectric constants, dipole moments and relaxation times 3=13102
- dielectric general theoretical and experimental work 3=13102
- dielectric instrumentation and measurements 3=13102
- dielectric molecular and ionic interactions 3=13102
- dielectrics, applications 3=13102
- dielectrics, breakdown 3=13102
- dielectrics, solid, conduction phenomena 3=13102
- earth's magnetic field meas. by satellite 3=11466
- earth's upper mantle, longitudinal waves 3=21026
- electricity, direct conversion, plasma physics appl. 3=5618
- electron microscopy 3=21881
- elementary particles, interactions, resonances 3=24670
- elementary particles, resonant states 3=14872
- eye, spatial summation in pathways 3=13964
- ferroelectric and piezoelectric materials 3=13102
- ferromag. relaxation, 3=1162
- gas determination in metals 3=11370
- generation of high mag. fields 3=21930
- geophysical prospecting 3=3424
- gravitational instability of compressible medium 3=9156
- gravitational waves 3=21211
- heat transfer 3=11971
- heat transfer, comprehensive 3=7364
- heat transfer, Japanese works 3=14391
- heat transfer, recent research 3=275
- heat transfer, Russian works 3=11972
- high polymetric materials 3=13102
- infrared physics 3=9652
- instrument calibration systems 3=21187
- insulating films and fibrous materials 3=13102
- ionic crystals, exo-emission 3=19295
- irreversible processes, general theories 3=21251
- lattice dynamics, Born theory and recent techniques 3=22634
- liquid dielectrics 3=13102
- liquids, X-ray study 3=21303
- magnetic fields meas. methods 3=9906
- magnetic storm sudden commencements, impulses and durations 3=9132
- magnetohydrodynamics 3=12297
- magneto-optical effects using polarized i.r. 3=14377

Bibliographies — contd

lasers and lasers 3=14795
 masers, optical 3=7728
 masers, optical 3=7729
 masers, optical, gaseous 3=7730
 mass spectrometry, vacuum techniques 3=12263
 melting point rel. to pressure 3=19068
 metal surfaces, nearly perfect, prep. and props. 3=23500
 metals, f.c.c., irradiated, point defects, review 3=8420
 metals, liquid, electron transport and states 3=21401
 metals, physical props. at high freq. 3=6448
 metals, radiation damage, nature 3=8466
 microtron electron accel., review 3=14693
 molecules, internal rotation, potential functions 3=25082
 molten metals and semiconductors, elec. props. 3=9475
 Mössbauer effect, teaching 3=6143
 n.m.r. in mag. materials 3=3187
 n.m.r., principles and use in phys. chem. 3=25139
 n.m.r. in solids, quadrupole effect 3=25586
 n.m.r. studies of H bond 3=25140
 nuclear structure rel. to elem. particle physics 3=540
 nucleon, e.m. structure, isoscalar 3=14968
 optical instrument testing 3=244
 optical materials, infrared 3=16750
 planetary radio emission 3=23708
 plasma and thermonuclear physics, 1958-62, annotated 3=9766
 plasma phys., thermonuclear res., and accel. 3=12098
 plasma, spectral meas. techniques 3=7577
 photography, ultrahigh-speed, instruments 3=21579
 polar cap absorption, particle bombardment 3=13795
 polarization waves in solids 3=25388
 porphyrins, spectroscopy 3=25129
 pulsed spark gas discharges, for light sources 3=14546
 pumping at solid surfaces 3=21454
 radiation, belt, outer 3=16283
 radioastronomy, physical basis 3=11587
 Raman spectra in crystals 3=937
 rare-earth elements, 1st and 2nd spectra 3=19946
 reactor-radiation effects on structural materials 3=18209
 Rowland, H. A., visit to Europe 3=3698
 scintillation counters, gaseous 3=12372
 semiconductor band theory, review of recent progress 3=10746
 semiconductors, effective mass measurements 3=10743
 semiconductors, Faraday effect, theory 3=23047
 semiconductors, neutron irradi. effects 3=25336
 semiconductors, optical properties 3=10906
 semiconductors, transport, experimental, recent developments 3=10730
 shock waves, nonequilibrium phenomena 3=16695
 shock waves, theory 3=18892
 solar protons and magnetic storms 3=7952
 solar spectroscopy, rocket-borne instruments and techniques 3=11531
 solar-wind-magnetosphere interactions 3=9134
 solid films, reactivity rel. to irradi. 3=6896
 solid inorganic insulation 3=13102
 spectroscopy, extreme u.v. 3=14337
 spectroscopy, vacuum u.v. 3=7325
 sun-earth relations during IGY and IGC 3=11475
 sun, u.v. and X-ray spectrum 3=23685
 superconductivity 3=325
 superconductivity, metals, alloys, transition temps. 3=14438
 superconductors, high-field 3=12021
 transport props. in dilute alloys 3=8382
 tunnel diodes 3=15604
 Ukrainian physics research 3=18686
 ultrasonics and colloids 3=6936
 Van Allen particle motion and energy spectra 3=23642
 viscosity, liquids 3=14112
 wavelength meas. in vacuum u.v. 3=21538
 Wigner's (E.P.) work 3=3700
 X-ray analysis, origin and development 3=25682
 X-ray crystallography of biologically important macromolecules 3=23438
 B elements, liquid, mag. susceptibilities 3=9480

Bibliographies — contd

Co, plastic deformation 3=18187
 Cr_2O_3 - Fe_2O_3 mag. structure 3=13267
 Fe, b.c.c. and f.c.c., lattice stability 3=13523
 ZnS, model of i.r. luminesc. centre 3=8621

Binary stars

See Stars.

Biographies

Alfred Kastler, C.E.K. Mees Medalist, 1962 1=16477
 Bohr 3=7081
 Einstein, five conversations 3=3699
 Frenkel, Y.I. 3=23723
 Friedman, 1962 Oersted medalist 3=21182-3
 Graham, C.H. 3=21184
 M.V. Lomonosov, contrib. to 18th cent. physics 3=16484-5
 Niels Bohr, appreciation 3=13986
 Onsager 3=9356
 S.I. Vavilov, in relation to luminescence 3=9312
 S.I. Vavilov 3=16478
 S.I. Vavilov 3=16479
 S.I. Vavilov 3=16480
 S.I. Vavilov 3=16481
 S.I. Vavilov 3=16482
 S.I. Vavilov 3=16483
 Wigner, E.P. 3=3700

Biological effects of radiations

aspects in nuclear energy, encyclopaedia 3=4285
 cosmic-ray hazard at aircraft altitudes 3=11617
 dog-carrying satellites, doses meas. 3=3634
 human radiation hazards, review 3=3645
 man in space, review of possible radiations 3=3633
 pest control, invertebrate 3=18441
 pest control of vertebrates 3=16442
 relative efficiency determ. by columnar recombination 3=1550
 water phantom, scattered radn. meas. and calc. 3=7062
 water phantom, Cs^{137} γ -ray spectral distrib. 3=7063
 DNA degradation by noncavitating ultrasound 3=20036
 Rn, inhaled from air, absorbed dose 3=5285

Biological technique and instruments

catheter-tip blood flowmeter for dogs 3=23717
 freeze-drying of tissues with thermoelec. unit 3=11619
 Fricke dosimeter, use of ion exchange column 3=7750
 luminescence appl. 3=9469
 luminescence, uses of 3=13942
 manometer, electronic, for blood pressure 3=1548
 mechanical props. tester for low audio and subaudio frequ. 3=3783
 microspectrophotometers with CdSe cells 3=24024
 oximeter for blood, in vivo 3=3649
 Peltier refrigerator, study of thermal sensitivity of skin 3=21601
 radioactive scintillation scan data, magnetic tape recording 3=21147
 X-ray crystallography, of large mols., review 3=23438

Biology

See also Medical science; Physiology; Zoology.
 heredity "code" as D.N.A. nucleotide sequence, review 3=18669
 mathematical principles 3=3646
 physico-mathematical aspects conference 3=13941
 role of inclusion compounds, review 3=1250
 theory, limitations of predictability 3=3650
 tree, living, elec. current during thunderstorm 3=9035

Biophysics

"bit", subjective value 3=7060
 breathing; unequal distribution 3=3635
 diffusion in biological phenomena 3=3642
 discrimination and learning; neural net models 3=3640
 eleven papers presented in Italy 3=16439
 enzymic reactions 3=3382-3
 haemoglobin-gas reactions 3=3383
 leaves, green, luminescence, near i.r. 3=21149
 macromolecule polymerization on templates, kinetics 3=25995
 macromolecules with saturated chains, attractive forces, biol. applications 3=2676
 neuron network, circuit theory 3=7061
 neutral interaction, mathematical model rep. 3=3638

Biophysics — contd

- osmosis in binary systems, thermodynamic limit 3=14151
- protein — molecule reactions 3=3383
- psychological phenomena, neural net theory applies. 3=3639
- pulmonary CO₂ diffusion, rel. to human cardiac output meas. 3=3637
- renal, biliary concretions, composition 3=3647
- respiratory "chemostat", cybernetic analysis 3=3636
- scattering, acoustic waves, ultrasonic, by fish, in sea 3=18931
- X-ray crystallography of macromolecules, review 3=23438

Birefringence

See Double refraction.

Bismuth

- abrasive wear, effect of brittle fracture 3=13386
- acoustic amplification, 15 Mc/s steady mag., pulsed elec. fields 3=20095
- amorphous, films, electron diffr. exam. 3=16123
- atom, μ -mesonic, X-ray transition energies 3=6370
- carrier conc. change due to Se admixture 3=4904
- cleavage dislocations 3=12983
- in contact with Sn, Pb, melting 3=15525
- crystal electron state density, conduction band 3=20322
- crystallization from melt, elastic vibr. effect 3=18248
- crystallization front, solid-liq., oscillations 3=25664
- cyclotron resonance and correl. function for electron gas 3=6507
- cyclotron resonance, Doppler shifted, and Alfvén wave damping 3=4854
- cyclotron resonance, hybrid and "tilted-orbit" 3=4853
- cyclotron resonance meas. 3=4852
- der Haas—van Alphen effect rel. to Sb impurities 3=3083
- dislocations prod. by spark discharge 3=12969
- elec. conductivity, quasistatic, in mag. field 3=2903
- electric field gradient calc. 3=8332
- electrical and thermal transport props. 3=10808
- elec. resistance, 4.2°-1.65°K, rel. to sample size 3=2851
- electron transport phenomena analysis 3=25354
- Esaki conduction effect, nonlinear effect 3=25353
- Ettingshausen figure of merit 3=13070
- films, on Bi, cleavage faces, by thermal evaporation Ion, structure 3=16136
- films, thin, thermal effects during condensation 3=19074
- films, transverse electric field effects 3=15541
- freezing pt., pure metal, precision temp. standard 3=9642
- Hall coefficient 3=10807
- Hall effect, thin films 3=6564
- internal friction, effects of temp. (room-200°C) and number of elastic-plastic cycles 3=6778
- i.r. absorptance and elec. carriers 3=4970
- liquid, Ag diffusion, 300-700°C 3=21331
- liquid, density rel. to temp., and m. pt. 3=3793
- liquid, electron diffr. exam. 3=16123
- liquid, ultrasonic propagation and viscosity 3=9457
- magnetoabsorption, i.r., and band gap 3=8592
- magneto-reflection and semicond. props. 3=8581
- magnetoresistance 3=22904
- magnetoresistance non-linear rel. to electron-phonon interaction, 2°-4°K 3=10803
- magnetoresistance, nonohmic, low-temp., thermal origin 3=8512
- magnetothermal oscillations at low temp. 3=2743
- melting 3=24109
- microwave-induced d.c. voltage 3=2856
- non-ohmic behaviour, acoustoelec. current 3=2876
- phase transformations, effect of Sb and Pb impurities 3=25751
- phase transitions, up to 70 kbar 3=19067
- photoelectromagnetic effect and photoconductivity 3=8572
- resist. elec. and Hall coefficient, var. with grain size 3=20323
- scattering time at low-temp. 3=10809
- Shubnikov—de Haas effect 3=15586
- solid solubility in Ge, saturation diffusion expt. 3=3342
- structure, effect of pressures to 20,000 atm. 3=18017

Bismuth — contd

- superconducting critical fields of modifications II and III 3=21662
 - surface resistance, cyclotron resonance and quantum oscillations 3=17697
 - thermoelectric figure of merit 3=20424
 - thermoelectricity in mag. field, Kelvin reln. 3=8573
 - thermoelectricity, use for low-temp. refrigeration 3=359
 - thin films, magnetoresistance, thermal evolution 3=8517
 - twinning, structure of accommodation region 3=8801
 - ultrasonic amplification, steady mag., pulsed elec. fields 3=20095
 - u.s. vel., oscill. changes with var. mag. field, 4°K 3=8402
 - vapour pressure of liquid 3=9662
 - Bi-Bi₂, elec. cond. of molten solns. 3=11805
 - Bi-Bi₂, electronic conduction in melts 3=11806
 - Bi-Bi₂, mag. susceptibilities of molten solns. 3=11807
 - Bi-Sb thermojunctions 3=15640
 - Ni-C, crystallization, effect on, as impurity 3=16115
- # Bismuth compounds
- Ag + Bi alloys, liquid, vapour pressure 3=14422
 - Bi base cast alloys, elec. resist. rel. to composition 3=20262
 - BiBr, emission spectrum, A → X system analysis 3=6389
 - Bi-Cu, liquidus curve 3=5554
 - BiFeO₃, antiferromag. props. 3=3147
 - BiFeO₃, lattice constants and magnetic properties, rel. to temp. 3=20770
 - BiFeO₃, magnetic ordering, by neutron diffraction, 20 and 600°K 3=5018
 - BiIn, de Haas—van Alphen effect 3=12944
 - BiOCl films, electron diffraction intensities rel. to tilting and λ H 3=1295
 - BiOCl thin films, electron diffraction intensities rel. to tilting angle, crystal size & wavelength 3=1372
 - Bi₂O₃-Nb₂O₅ systems, phase equil. relns. 3=6813
 - Bi-0.2 at.% Sn, light and heavy holes 3=25355
 - Bi-Pb alloys, hexagonal close-packed structures 3=8883
 - BiPb liquid n.m.r. 3=21419
 - Bi-Pt, between PtBi and PtBi₂, structure 3=11280
 - Bi₄S₃, conductivity electrical and Hall effect, single crystals 3=22937
 - Bi-Sb alloy, magnetoresistance non-linear rel. to electron-phonon interaction, 2°-4°K 3=10803
 - Bi-Sb alloys, magneto-Seebeck effect 3=10896
 - Bi-Sb alloys, magnetothermal effect, band structure explanation 3=20324
 - Bi-Sb alloys photoelectromagnetic effect and photoconductivity 3=8572
 - Bi-Sb alloys, resist. elec. and Hall coeff., var. with grain size 3=20323
 - Bi-Sb alloys, thermoelec. props., rel. to mag. fld. 77°-295°K 3=10894
 - Bi-Sb alloys, thermoelec. props. rel. to mag. fld., 78°-295°K 3=4958
 - Bi-Sb alloys, thermomagnetic effects, 80° to 300°K 3=10806
 - Bi-Sb alloys, thermomagnetic figure of merit, and Ettingshausen cooling 3=22938
 - Bi-Sb, effective masses meas. 3=15587
 - Bi-Sb, Ettingshausen figure of merit 3=13070
 - Bi₂₄Sb_{60-1X}Te_{180-1X}Se₄ thermoelec. props. 3=13138
 - (Bi_{1-X}Sb_X)₂(Te_{1-X}Se_X) (TySe_{3-y}), elec. and thermoelec. props. 3=17869
 - Bi, Se₃, doping mechanism 3=8516
 - Bi₂Se₃, electrical props. rel. to elastic strain 3=10832
 - Bi-Se system, monotectic reaction 3=16107
 - Bi-Si, heated to 600°C, electron diffrn. study 3=25788
 - BiTe band structure, calc. by augmented plane waves meth. 3=10746
 - Bi-Te, solid solubility rel. to composition 3=3343
 - BiTe-SbTe, vacancy loops 3=17709
 - Bi₂Te₃, dendritic growth surface features 3=25679
 - BiTe₃, diffusion of Au 3=17781
 - Bi₂Te₃, diffusion and solubility of Ag 3=12998
 - Bi₂Te₃, electrical props. rel. to elastic strain 3=10832
 - Bi₂Te₃, electronic band structure 3=10627
 - Bi₂Te₃, galvanomagnetic props., anisotropy 3=10804
 - BiTe, mobility 3=10805

Bismuth compounds—contd

- Bi₂Te₃, p-type, valence band structure meas. 3=25240
 Bi₂Te₃, plate, elec. potl. across, rel. to deformation 3=2901
 Bi₂Te₃, point defects, γ -induced 3=22712
 Bi₂Te₃, sintering, cold compacting 3=3346
 Bi₂Te₃, thermodynamic props., 370-410°K, ΔZ , ΔS , ΔH 3=22657
 Bi₂Te₃, in thermoelec. elements, efficiency 3=2985
 Bi₂Te₃-Bi₂Se₃ alloys, crystal structure and electron energy gap 3=13500
 Bi₂Te₃-Bi₂Se₃, diffusion of Ag, and escape, effect of atmosphere 3=20219
 Bi₂Te₃-Sb₂Te₃ with added Te and Se, thermo-electric props. 3=913
 Bi₂Te_{3-x}Se_x, elec. and thermoelec. props. rel. to O content 3=860
 Bi₂Te₃₋₇Se_{0.3}, thermoelec. props., doping effects 3=10895
 Bi₂Te_{3-x}Se_x, crystal structure 3=13511

Bitumen

See Materials

Blood

- flow, pulmonary arterial, in dogs 3=23717
 manometer, electronic, amplitude - freqn. reln. 3=1548
 oximeter, cuvette, allowing for light scattering 3=13943
 oximeter, in vivo, with fast response 3=3649
 Na²⁴ activity, meas. by neutron dosimetry 3=21151

Boiling

See also Distillation.

- bubble dynamics from exponentially heated surfaces in a liquid 3=12004
 bubble-growth mechanism at heating surface 3=23863
 film, heat transfer from horizontal surface 3=1849
 isotope effects on equilibria 3=21611
 liquids under high pressure, crit. thermal load 3=3929
 n-pentane, pool-boiling heat-transfer 3=298
 nucleate, heat flux correl 3=14419
 nucleate, heat transfer from horiz. surface 3=1869
 nucleate, isolated bubbles region, analysis 3=7392
 superheated liquid, nucleation, elec. field effects 3=14420
 water, cooling nichrome wire, in centre of glass pipe 3=9661
 water drop, Leidenfrost phenomenon at 100°-500°C 3=7389
 water-1 butanol mixtures, bubble growth 3=18796
 He, heat transfer 3=9671
 He, liquid, film, at heated plates 3=21643

Boiling point

- liquids, electric fields, no effect up to 30 kV/cm 3=16839
 methane 3=9659
 superconducting metals, absolute, empirical law 3=24132
 Ar 3=9659
 CO 3=9659
 CO₂ 3=9659
 Hf 3=7390
 Kr 3=9659
 N₂ 3=9659
 Xe 3=9659

Bolometers

- dynamic characteristics, theory and exper. data 3=21610
 fast, for 20 μ -20A gas radiation 3=7274
 superconducting, nonisothermal 3=11997
 transverse film 3=12042

Bonds

See also Molecules.

- aliphatic C-C and C-H, electron polarizabilities and mag. susceptibilities 3=2636
 alkali hydride molecules 3=17569
 alkali metaborates, from i.r. spectra 3=25808
 aluminates, Al-O, tetrahedral distance 3=25715
 n-amyamine, H-bonding dimerization 3=2638
 anthrols, electronic spectra and H bonding 3=8287
 chemical coupling, non-trivial, sufficient condition 3=11345
 chemical, effect on X-ray spectra of atoms in cpds 3=8658
 and chemical reaction activation energy 3=18440
 complexes with odd ligand states 3=15333
 conjugated systems, order matrix calc. 3=8237

Bonds—contd

- covalency calc. from e.p.r. 3=8705
 covalent-bond asymmetrics from Zeeman-split NQR 3=8744
 covalent cubic diamond-type lattice, rel. to structure 3=10618
 crystal phosphors, rel. to electroluminescence 3=15718
 cyanoacetylene, H bonding 3=7216
 diamonds, covalent, simplified tight-binding approx. 3=22622
 dibenzenechromium; apparent alteration rel. to "pseudo Jahn-Teller effect" 3=729
 dipole moment, $\partial\mu/\partial r$, tables, polyatomic mols. 3=15323
 electronegativities and orbitals 3=12807
 ethane (C¹³C¹³H₈), C-C distance 3=20007
 ethyl ammonium ions, long-range N¹⁴ coupling 3=12864
 ferrocene, magnetic anisotropy meas. 3=8639
 ferroelectric crystals, proton-lattice interact. 3=15408
 formation, time-dependent statistics 3=8946
 Group III-V semiconductor, with Group IV substituents, covalent, energies 3=22758
 hydrocarbons, C-H moment 3=15334
 hydrocarbons, effect of molecular bonding on ionization coeffs. 3=9721
 inclusion compounds, dispersion forces, review 3=1250
 inert gas halides 3=4750
 intermetallic cpds., tetrahedral, mol. orbital 3=776
 length determ., from Weissenberg photographs 3=25699
 Madelung constant, C3 and C9 structures 3=20047
 metal borides, electron requirements 3=8330
 metals, interatomic, var. with electron structure 3=20045
 methyl-substit. mols., hyperconjugation, rel. to proton hyperfine splitting 3=739
 molecular crystals, rel. to compressibility 3=15985
 molecular, deriv. from e.s.r. meas. 3=17611
 molecular refractivities 3=15332
 molecules, polyatomic; distance and angular centrifugal distortion 3=2607
 molecules with π -electrons, H-bonds in excited states 3=25086
 nuclear coupling const. as measure of s-character 3=12862
 orbitals, hydrid, and hexagonal structure of Fe-Ni alloys 3=8884
 perovskites, cubic, superlattice Madelung energy 3=20046
 polymers, C-C, rupture energy differences, explanations 3=20038
 α -quartz, bond lengths 3=18318
 rel. to film growth 3=16132
 semiconducting sphalerite-type structures, rel. to mag. susceptibility 3=20549
 semiconductor, atomic, rel. to mechanical properties 3=25824
 semiconductors, covalent 3=10566
 semiconductors, diamond-type, dangling orbitals on clean (111) surfaces 3=10748
 semiconductors, nature 3=2687
 silicates, Si-O, tetrahedral distance 3=25715
 sklodowskite, U-O bond length 3=16085
 spin-spin coupling across several bonds 3=719
 III-V cpds., A surfaces, rel. to elastic strain 3=3219
 two-electron bond, heteropolar case 3=12808
 valence-bond dependence upon substituents of C¹³-H and Si²⁹-H coupling 3=2661
 zinc blende structure, rel. to energy bands 3=25230
 AlF, from spectrum, microwave 3=19973
 As₂S₃, As-As and S-S 3=727
 B hydrides, energies and distances 3=22556
 BN, direct trans. of hexagonal to denser forms 3=11203
 BN, thermal transformation from turbostratic to ordered-layer-lattice 3=11201
 C-C and C-halogen, diamag. anisotropy effects in n.m.r. 3=17615
 C-C and C-H, diamag. anisotropy 3=22585
 C-C, chemical shift in n.m.r. spectra of cyclohexyl derivatives 3=8297
 C-C, diamag. anisotropies under mag. field 3=15375
 C-F, lengths and strengths 3=8244
 C-H, vibrations, stretching and planar bending, -180 to 20°C 3=22577
 C¹³-H, effect of substitution, methanes 3=20001

Bonds—contd

- C₂, C₃, C₄ and electron density distrib. 3=22540
 CdSb, anisotropy of chemical bond 3=25649
 CdSb, two conduction zone model 3=25357
 CdSe, covalency, rel. to internal fields 3=11115
 (CH₃)₃C¹⁸Cl, rel. to quadrupole coupling 3=4769
 CH₄, BH₄⁺, NH₄⁺, isoelectronic systems, bond lengths 3=22554
 C₂H₂, bond lengths 3=10531
 CHCl₃, CDCl₃, bond polarizability derivatives 3=20006
 ClO, symmetric, asymmetric stretching freqs. 3=12838
 Cr cpds., chemical bond and X-ray emission 3=23086
 Cr ferrite, atomic bond energies, effect of alloying elements 3=20900
 CrB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121
 Cr—O₂ in K₃CrO₈, covalent character rel. to e.s.r. and optical spectra 3=3166
 CuFeS₂, 3d-shell, sp³ bond 3=1027
 DCrO₂, O—O, by neutron diffraction 3=1334
 Fe—butadiene-like residues 3=2643
 Fe cpds., complex and covalent, Mössbauer study 3=12894
 Fe-group ions in fluoride crystals 3=15407
 Fe-group ions in fluoride crystals 3=20043
 Fe silicides, 3d-electrons of Fe 3=20041
 Fe—Mo solid solutions, X-ray spectra investig. 3=5141
 Ge—Ge in solid, strength 3=25177
 H, adsorbed layer, effect on elastic props. 3=6897
 H bond, in organic liquids, dielec. props. 3=21385
 H-bonded liquids, structure, by neutron scattering 3=5428
 H, charge transfer theory 3=25087
 H, for water in organic solvents 3=9449
 H, halide anions as proton acceptors 3=17566
 H halides, H-bond with org. oxygen cpd. 3=2629
 H, in cyclic cpds., rel. to ice nucleation 3=3267
 H, in isopropanol 3=12853
 H, in naphthazarin, quinizarin, radicals, anion, by e.s.r. 3=17610
 H, organic cpds. containing π -electrons, effect on p.m.r. 3=15383
 H, in organic molcs., vibration, by i.r. spectroscopy, proposed study 3=6378
 H, Raman spectrum in Rochelle salt, para-ferroelectric transition mechanism 3=20484
 H, studies by n.m.r., association shift 3=25140
 HCrO₂, O—H—O, by neutron diffraction 3=1334
 He³, three-body bound state, binding energy 3=25109
 Hg halides, in molten state 3=9460
 H—H, intermolec. in 7 compounds, rel. to vibration freq. 3=25152
 MgS₂O₃·6H₂O, O—H and H—H 3=25721
 Mn complexes, s- and p-bonding 3=10564
 Mo silicides, covalent components 3=25213
 Mo₂B₃, quadrupole bond, n.m.r. meas. and calc. 3=11121
 Mo₂Cl⁴⁺ 3=8281
 NH₄H₂PO₄, H—O bond, resonance with NH₄⁺, from i.r. absorpt. spectra 3=15342
 N—N in cyanogen 3=25729
 NSF 3=22563
 NbB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121
 Ni—Mo solid solutions, X-ray spectra investig. 3=5141
 O—H bond, absorpt. band, effect of ions 3=8285
 PO, symmetric, asymmetric stretching freqs. 3=12838
 Pr, in La cpds., covalence change 3=23072
 Pt—S, in dithiocarbamate Pt^{II} complex, stretching bands and force constant 3=25120
 S—N, bond order versus length reln. 3=727
 S₄N₄, S—S and N—N 3=727
 Sb—Br, energy, from heat of vapourization, SbBr₃ 3=21629
 Sb—I, energy, from heat of vaporization, SbI₃ 3=21629
 Sb—S in stibnite 3=11128
 SiC, ionic and atomic contrib. 3=6451
 SiC, rel. to A^{III}B^V cpds. and ZnS 3=2688
 Si—C strength, in methyl—fluoro—silane series 3=20011
 Si—Si in solid, strength 3=25177
 Sn—organic cpds, rel to Mössbauer spectra peculiarities 3=744
 TaB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121
 Ta₂Cl₂²⁺ 3=8281
 Ti cpds., X-ray spectra, emission, K β , line changes 3=23092

Bonds—contd

- TiB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121
 TiN, metallic 3=8331
 U carbides, numbers 3=20843
 U—O, force const., in UO₂²⁺, from K₂UO₂F₆ spectrum i.r. 3=22575
 W nitrides 3=13462
 Xe fluorides, wavefunctions 3=17589
 Xe—F in XeF₄ 3=12868
 XeF, Xe—F distance 3=16075
 XeF₂, Xe—F distance 3=16074
 XeF₂, XeF₄, binding mechanism 3=15257
 XeF₂, XeF₄ 3=20000
 XeF₄ 3=12844
 Xe—O in XeOF₄, double character 3=17590
 ZrB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121

Bond

- acoustic propag., review and work of Békésy 3=3668

Books

- adsorption and collective paramagnetism 3=20995
 biology, physico-mathematical aspects 3=13941
 comets, nature of, by Richter, translation 3=13868
 dielectrics, progress review 3=22970
 gases, real, theory 3=11816
 general relativity and grav. waves 3=24
 geophysics, applied 3=3424
 heat transfer bibliography 3=7346
 luminescence of crystals 3=6664
 mechanics, advanced math. treatment 3=1642
 masers and lasers 3=14795
 noise, statistical properties 3=11871
 nuclear energy, concise encyclopaedia 3=4285
 nuclear handbook 3=2146
 nuclear science and technology, advances 3=2511
 nuclear shell theory 3=12545
 optical phenomena, photographs 3=257
 photoelectrets, electrophotographic process 3=15622
 statistical thermodynamics, elements of 3=7134
 superconductivity 3=325
 tensor calculus 3=5318
 tensor calculus and relativity 3=31
 ultrasonics and colloids 3=6936

Boron

- crystals, pure, preparation 3=11226
 diffusion in graphite 3=13000
 diffusion in Si, distrib. 3=22822
 diffusion, in Si, ion bombarded 3=22823
 diffusion in Si through oxide layer 3=10690
 diffusion in Si through SiO₂ layer, anomalous 3=17789
 diffusion into Si, through Si oxide layer 3=8453
 films, on thin C backings, prep. 3=11319
 films, prep. and props. 3=18411
 isotope separation, B¹⁰F₃—B¹¹F₃, enrichment coeff. meas. 3=15307
 in meteorites, and B¹¹/B¹⁰ ratio, and in earth 3=13876
 n.m.r., amorphous, α and β rhombohedral 3=20678
 neutron absorpt., thermal, precise meas. 3=12694
 paramagnetic resonance, rel. to C content 3=11110
 resistivity rel. to pressure up to 3×10^8 kgm cm⁻² 3=2902
 rhombohedral modification, crystal structure 3=13449
 stress—strain yield plateau on addition to α -Fe 3=13357
 sublimation, heat of, and dissociation of B₂ 3=305
 thermal conductivity, 4°—300°K 3=25211
 thin films prepn. for neutron cross-section meas. 3=11321
 volatilization, in d.c. arc 3=19220
 B¹¹, specific isotope shift calc. 3=10456
 B¹¹, 2³S state, 20-parameter calc. 3=2581

Boron compounds

- borate glasses, alkali, B n.m.r., var. composition 3=18147
 borax, n.m.r. of B¹¹ 3=15963
 borax, proton cond., polariz. effects 3=8483
 borax, proton conductivity 3=2904
 borosilicate glass, granular structure, by electron microscopy 3=13545
 hydrides, LCAO—MO calc. 3=6396
 metaborates, gaseous, properties 3=25807
 metal hexaborides, n.m.r. of B¹¹ 3=20677
 tinalconite, n.m.r. of B¹¹ 3=15963

Boron compounds — contd

- B hydrides, bond energies and distances 3=22556
 BP, coherent Bragg scattering of neutrons 3=1312
 B_2D_6 , heat of formation 3=6913
 B_4C , vapour pressure 3=305
 BF, BCl spectra, attributed to CCl^+ and CF^+ 3=8252
 BF_3 , isotope exchange with organic complexes 3=15361
 B_5H_9 , molecular orbitals 3=12816
 $B_{10}H_{12}$, molecular orbitals 3=12816
 $B_{14}H_{10}$, molecular, crystal and valence structures 3=19990
 $B_{18}H_{12}$, molecular structure 3=5109
 BN, electronic excited states, model 3=778
 BN, multilayer adsorption of Ar and N_2 3=6894
 BN, valence band, l.c.b.o. method 3=779
 B_2O_3 , apex angle of molecule 3=10527
 B_2O_3 , B_2O_2 , BO_2 , i.r. absorption in solid A matrices 3=8272
 B_2O_3 , glass, i.r. spectra 3=13174
 B_2O_3 , thermodynamics of vaporization 3=25809
 $(BOC)_3$, entropy and heat of formation 3=23538
 $B(OD)_3$, molecular vibrs. in-plane, force consts., calc. 3=22555
 $B(OH)_3$, molecular vibrs. in-plane, force consts., calc. 3=22555
 BP, electron transfer 3=20044
 $B_{12}P_2$, crystal structure 3=6844
 HBO_2 , crystal structure of γ and β forms 3=13465-6
 $PbO-B_2O_3$, glasses, structure, by n.m.r. 3=18148

Bosons

See Fundamental particles; Quantum theory, many-particle systems.

Breakdown, electric

See also Discharges, electric; Electric strength.

- air, damp, potential in uniform field 3=19227
 air, enclosed gap, rel. to chemical products of spark 3=4100
 atmosphere, microwave 3=4096
 dielectrics, bibliography 3=13102
 glow, breakdown voltage rel. to previous discharge 3=4060
 in long discharge tubes 3=4098
 prebreakdown conduction in vacuum, effect of electrode treatment 3=14561
 pre-breakdown field emission 3=21850
 spark gap, triggered 3=4099
 vacuum, by particle impact 3=380
 in vacuum, glass contamination, electrode curvature effects 3=9759
 vacuum, prebreakdown discharges 3=9758
 CdS , crystals, cine recording methods 3=1845
 Ge, thin films, low temp., rel. to thickness 3=20311
 H_2 , between plane Pt electrodes, 2nd Townsend coeff 3=7492
 SF_6 spheres and SF_6 -air mixtures, voltage 3=4095
- gases**
- air, between plane electrodes, rel. to press. 3=4091
 air, dry and humid, electron avalanche pulses, $pd = 100$ to 2200 mm Hg 3=4085
 air, electrodeless discharge in crossed fields 3=371
 air gaps, large, in non-uniform fields 3=379
 air, mechanism, rel. to electrode separation 3=4087
 air, microwave, elec. fields meas. 3=14560
 air, microwave meas. 3=5648
 air, rod-plane gaps, high-voltage impulse 3=4097
 air, time lag in crossed elec. and mag. flds. 3=5646
 air, trigatron spark gap, initiation 3=24248
 crossed fields, equiv. pressure concept 3=4094
 electrodeless discharge in transverse mag. field 3=9743
 electron avalanche components, temporal growth meas. 3=4086
 h.f. discharges, secondary electron resonance 3=24264
 impulse, positive channel growth 3=4101
 in linear accelerators, prevention by inclined fields 3=9884
 low-press., short duration times, theoret. and exptl. 3=3089
 low-press., time, graphical results 3=4093
 methane, avalanches, carrier amplification 3=9761
 organic vapours, mechanism, effect of coeff. of secondary ionization 3=21756
 Penning device, below 10^{-8} torr. 3=4088
 propane, between plane electrodes, rel. to press. 3=4091

Breakdown, electric — contd**gases — contd**

- r.f. excited gas, mag. field effect 3=24263
 spark, ionizing potential wave obs. 3=9760
 streamer mechanism rel. to electronegativity 3=1957
 in thermionic gas-filled diodes 3=2024
 u.h.f., statistical and formative time-lags 3=7491
 wave phenomenon, fast dynamical, in plasma shock-tube 3=1955
 wave propagation, theory 3=1956
 Ar, in external-electrode glass cells at steady alternating pots. 3=4092
 Ar, microwave meas. 3=5648
 Ar, between plane electrodes, rel. to press. 3=4091
 Ar, uniform field, for low E/p values 3=4011
 H₂, between plane electrodes, rel. to press. 3=4091
 H₂, d.c. and microwave avalanche 3=12072
 H₂, microwave, electron ioniz. freq. meas. 3=12071
 H₂, pre-breakdown ionization coeffs. 3=4007
 H₂, 10^{-6} mm press., using secondary electrons 3=4090
 He, 10^{-6} mm press., using secondary electrons 3=4090
 I vapour, effect of tube dia., 50 c/s 3=9514
 N_2 , avalanches, carrier amplification 3=8761
 N_2 , compressed 3=21708
 N_2 , electron avalanche pulses, $pd = 100$ to 2200 mm Hg 3=4085
 N_2 , microwave, elec. fields meas. 3=14560
 N_2 , microwave meas. 3=5648
 Ne-(0.01-0.3 %) Ar, ignition and burning voltages 3=19221
 O_2 , microwave, elec. fields meas. 3=14560
 O_2 , microwave (3 cm) breakdown in flowing gas 3=9516

liquids

- dielectric liquids, conference, Durham, 1963 3=18824
 electrolyte, var. with cond. and electrode separation 3=9473

solids

- accelerated life tests in discharge conditions 3=16899
 ambient medium effect in elec. discharge 3=17946
 brittle dielectrics, mechanism 3=901
 brittle dielectrics, mechanism 3=6620
 corona discharges in solids, analysis 3=4104
 dielec., gaseous inclusion breakdown 3=1939
 dipolar dielectrics, thermal, voltage detm. 3=13124
 insulator surface, by secondary emission 3=19226
 use for mechanical breakdown, due to thermal stress 3=8565
 rock salt, mechanism, temp. calc. 3=25408
 semiconducting diodes, Si, alloy, D-209, surface breakdown 3=10856
 semiconductors, time behaviour theory 3=15561
 semiconductors, voltage bkdwn., low-temp., rel. to thickness 3=10768
 surface, voltage-graded, high voltage support ability 3=12097
 temp. distrib., time var., a.c. field 3=25407
 thermal, two-layer plate 3=8564
 $BaTiO_3$, with Au and Al electrodes 3=2962
 $GaAs$ p-n junction, breakdown voltage 3=25376
 $GaAs$, p-n junctions, elec. breakdown 3=20350
 $GaAs$, p⁺-on-n junction, voltage, as function of n-resistivity 3=13085
 Ge, avalanche, negative resistance effects, 4°K (bistable cryosar) 3=13060
 Ge, compensated, impurity breakdown., rel. to current oscillations 3=10769
 Ge, induced by illumination of compensated material 3=6583
 Ge, low-temp. breakdown, highly-compensated p-type 3=20310
 Ge, microplasma breakdown 3=25383
 Ge, n-type, low-field, time delay 3=857
 KCl, rel. to γ -irradiation 3=23020
 NaCl, high temp. mechanism 3=13123
 Si p-n junction, avalanche breakdown 3=15599-600
 Si p-n junctions, micropulses 3=2929
 Ta-anodic oxide film-metal counter-electrode 3=17930

Breaking strength

See Mechanical strength.

Bremsstrahlung

See also Electrons, radiation; Gamma-ray spectra; Gamma-rays; X-ray spectra, emission; X-rays.

- absorption in LiH 3=14948
- beta-decay, internal, Coulomb corrections 3=15130
- betatron, gamma-ray intensity rel. to injector focusing 3=24417
- electron energy loss at 1 MeV, ang. depend. 3=17699
- electron in polarizing medium 3=12432
- electron and positron, h.f. region calc. 3=4374
- electrons, transversely polarized, photon asymmetry 3=4375
- energy leakage from calorimeter absorber 3=14950
- energy meas. using energy filter, efficiency 3=24678
- ionized gas, Gaunt factors, nonrelativistic bremsstrahlung 3=1969
- monochromatic, prod. from thin crystals 3=14949
- μ -mesons, relativistic, energy loss rate 3=7882
- μ pairs, photoprod. in carbon, 1000 MeV 3=7879
- nuclear isomers, production 3=24856
- nuclear recoil in equivalent photon method 3=666
- π -meson prod., nucleon-nucleon collisions 3=19670
- plasma, generation and internal absorption 3=5682
- plasma, losses, no coherence effects 3=21789
- plasma, spectrum, and cond., electrical calc. 3=14563
- polarization calc. in nuclear field by equiv. photon method 3=2237
- polarization, circ., depend. on Z 3=22101
- polarization, circular, from e-polarized p collisions 3=12435
- polarized, by crystal, on electron incidence 3=5980
- protons, bombarding nuclei 3=14947
- spectral shape, near upper limit 3=24684
- X-ray, in betatron, 35 MeV, production 3=5983
- X-ray, ultrasoft, use for absorption spectra 3=4232
- Au foil, emission, rel. to electron bombardment 3=20536
- B¹¹, resonant scatt. by 2.14 MeV state 3=15171
- Ca⁴⁶, beta-rays, internal, spectrum 3=22327
- Ge, spectrum isochromat structure 3=8611
- Si, spectrum isochromat structure 3=8611
- Y⁹⁰ β decay 3=12626
- Y⁹⁰, β decay, first forbidden, internal, circular polarization, calc. 3=22332

Brightness

See also Illumination.

- candela, reproduction by secondary standard tungsten filament lamps 3=9317
- clouds, spatial distrib. 3=18509
- sparks, electric, peak, 4500-3000 A 3=4053
- stars, rel. to neutrino pair formation from photons 3=2232

Brittleness

See also Breaking strength.

- in abrasion of brittle solids 3=11188
- α -brasses, embrittlement process by liq. Hg 3=13378
- brittle solids, single fracture, fragment size 3=1239-41
- ceramics, polycryst., microstructure effects 3=23357
- electrodeposited Cu containing Mo 3=3237
- eutectic, quenched, degree of non-equilib. rel. to "superductility" 3=13533
- fracture propag., crack elasticity model 3=13381
- fracture, time depend., in surface active media 3=25642
- intermetallic cpds., grain-boundary regions 3=11184
- Magnox ZR 55, influence of H₂ pick-up 3=25761
- metals, b.c.c., rel. to recrystallization 3=18214
- polymethylmethacrylate, brittle fracture 3=3235
- Shock wave-front, on explosion 3=23970
- steel, rel. to neutron irradi. 3=11181
- steels, Mn-Mo, rel. to neutron irradiation 3=11182
- transition metals, rel. to neutron irradi. 3=8784
- Cr, ductility, effect of rolling temp., strain rate 3=3236
- Cr, recrystallization embrittlement process 3=16005
- Fe, rel. to neutron irradi., damage 3=8759
- Fe-Si rolled strips, anisotropy 3=3238
- MgO, neutron damage effects 3=25310
- Mo, cracks, nucleation on twin and grain boundaries 3=6803
- Mo, zone-refined, 4.2°-373°K 3=1236
- NaCl single crystals, ductility, effect of atmospheric reaction 3=13355

Brittleness — contd

- Nb, embrittlement by surface gas contamination 3=20755
- Ni, effect of dissolved H 3=11153
- Ta, due to H, influence of absorbed N and rate of deformation 3=6804
- U, ductility after work-hardening, partial annealing 3=6795
- W, cast, effect of recryst. anneal 3=11183
- W, ductile-brittle transition stress/strain curves 3=23307
- Zn, embrittlement by liq. Hg 3=18006
- Zn single crystals, temp. transition to plasticity 3=23316

Bromine

- acoustic absorption, liquid and solid 3=9458
- atmospheric content. 3=25868
- atomic structure 3=12755
- atoms, recombination mech. 3=6427
- molecules, dissociation 3=13594
- Br₂ liquid, structure by neutron diffraction 3=126

Bromine compounds

- Br hydrate, crystal struct., atomic, by X-ray diff. 3=18312
- BrCl, dipole moment 3=25141
- BrCN, vibration-rotation const. 3=12834
- BrF₃, molec. structure, force const., and thermodyn. props., calc. 3=2631

Brownian movement

- colloidal soln., theory 3=54
- Coulomb gas, model for random matrix eigenfunctions 3=5368
- dynamical study in fluid 3=23772
- in many-interacting-particle systems 3=11704
- nonlinear, of generalized Rayleigh model 3=5369
- non-linear, of Rayleigh model, generalized, "sticky" collisions 3=23771
- stochastic process of Keilson and Storer 3=14042

Bubble chambers

- analogue computer for topologically unusual interaction vertices 3=19522
- bubble rise, rel. to track distortion 3=2177
- circuits for correct operation 3=3975
- computer, digital, pattern recognizer 3=19521
- data processing, computer 3=19519
- data processing, computer programmes 3=19518
- electromagnets design 3=4246
- electrons, energy meas., length and sagitta 3=17249
- foam rupture by α -particles from Po²¹⁰ 3=17122
- Freon, 570 litre capacity 3=2176
- heavy liquid, 170 litre, Bookhaven 3=5905
- high mag. field, pulsed, 100 kG, heavy liquid 3=17128
- Hough-Powell analysis realization 3=24561
- Hough-Powell flying spot digitizer program 3=24562
- hydrogen, bubble density meas. 3=14835
- illumination system, photography of small bubbles 3=24559
- internal target, liquid H₂, methyl-iodide chamber 3=17129
- magnetic field non-uniformity correction 3=17136
- in metals, migration and coalescence of inert gas 3=25314
- nucleation in superheated liquids 3=14834
- nucleation theories 3=14834
- optical features in design of light-liq. chambers 3=17121
- oscillating, self, pressure, possibilities 3=17131
- particle energy loss correction 3=17136
- portable, 2 in., freon, far beam profile exam. 3=17130
- photographs, data extraction and processing 3=532
- photography 3=533
- propane, non superheated sensitivity with fast pressure reduction 3=24560
- propane, 2 metre, Dubua 3=17126
- review 3=17123
- scanning digitizer, flying line 3=19523
- scanning-measuring-projector on-line to digital computer 3=19520
- track centring device with digitalized output 3=4302
- track density, in Brookhaven 20-in. H chamber 3=14836
- track-density meas. uses, in identification 3=17133
- track gap counting, semi-automatic scanner 3=17135
- track gap length meas. 3=17134
- track meas., reduced 3=17137
- track measuring stage for films 3=4301

Bubble chambers — contd

- ultrasonic cavitation induced by neutrons, recoil proton tracks 3=17132
- unusual events, analysis by on-line computing system 3=7091
- Ar, liquid, use in 3=19524
- H and D, liquid, Saclay, operation and use 3=2173
- H, two, Moscow 3=17124
- H, 80 in. Brookhaven 3=17125
- H, 95 cm, Dubna 3=17127
- H₂ liquid, optical systems 3=4300
- H-D liquid, operating in mag. field, 8 litre 3=24558
- K meson track labelling by spark chamber triggered by Cherenkov counter 3=17339
- N₂ liquid, use in 3=19524
- Xe, γ -ray energy, det. method 3=2174
- Xe, multiple scatt. "constants", Molière 3=2175

Bubbles

- See also Foams.
- air, in collodion-water suspension, u.s. absorpt. 3=14262
- buoyancy increase, motion 3=11402
- cavitation, collapse 3=16599
- collapse of cavity bubbles, wall-effects 3=23861
- dynamic stability and growth, effect of initial air content 3=14135
- dynamics from exponentially heated surface in a liquid 3=12004
- in film boiling, formation and growth 3=1849
- gas in liquid, behaviour study; stroboscope circuit 3=1661
- growth mechanism at boiling 3=23863
- growth rate in boiling water-1 butanol mixtures 3=18796
- heat loss during sonoluminescence 3=18818
- in liquid under sonic u.s. oscillation 3=7181
- mass transfer thro' bubble trays 3=11751
- motion and growth in locking liquids, external field effects 3=123
- motion in charged dielectric liquid 3=9434
- nucleation in superheated liquid by elec. field 3=14420
- pulsation in liquids, theory for small amplitudes 3=23862
- suspended in liq., flow through tubes 3=11777
- two fluids between parallel plates, dynamic contact angle meas. 3=1672
- volume meas. by soap film motion 3=9435
- in water, radiation nucleation 3=23864

Cadmium

- absorption of 5-60 Mc/s ultrasonics in single alloying with Bi, thermodynamic properties 3=23548
- annealing spectrum after electron irradi., analysis 3=2846
- condensation in vacuum and props. of condensate 3=16036
- in contact with Sn, Bi, melting 3=15525
- cracks, development in presence of Ga 3=20757
- creep, pressure depend. 3=25630
- crystals, flow stress, strain-rate depend. 3=23338
- Debye temp., from low-temp. spec. heat 3=2733
- defect recovery, 78°-300°K after elongation at 78°K 3=22713
- deformation and fracture props. 3=15994
- diffusion in Zn, anisotropic 3=17793
- dislocation multiplication and structure 3=23324
- elec. resistance, 4.2°-1.65°K, rel. to sample size 3=2851
- elec. resistance, 10°-14°K 3=2852
- elec. resistance, rel. to impurity 3=25324
- electrochemical activity with respect to Tl 3=23548
- electronic structure, from acoustic data 3=10623
- Fermi surface from magnetoacoustic effect 3=22686
- Fermi surfaces, open cross-sections 3=17687
- field emission spectrum, fine structure 3=16972
- films, preparation, and u.v. absorption 3=11318
- films, unbacked, 50 $\mu\text{g cm}^{-2}$, preparation 3=11320
- flow under very small stresses 3=13366
- hardening by cyclic strain 3=13372
- imperfections, linear hexagonal networks 3=8436
- linear imperfections, hexagonal networks 3=22774
- liquid, Hall effect 3=16636
- magnetoplasma resonance, l.f., meas. 3=8409

Cadmium — contd

- molten, elec. resist. and Hall effect 3=9475
- neutron damage for thermal flux 3=2847
- plastic deformation, initial 3=18181
- shock compression up to 9×10^6 atm. 3=6786
- spark discharge, ion concn., time variation 3=2553
- specific heat, 1.5-4.2°K, Debye temp. 3=2733
- spectrum, emission, 1.6-3.7 μ 3=15281
- spin-orbital coupling in electron band structure 3=10626
- spin-spin coupling with protons 3=719
- superconductivity, isotopes 3=12030
- tensile props. of polycryst., -196°-200°C 3=6800
- thermal cycling effect on mechanical, elec. props. 3=3233
- Cd¹¹⁴ atom, (5s5p)³P₁ state, spin and nuclear moments 3=19931

Cadmium compounds

- alloys, impurity electronic structure 3=22757
- Cd-Ag, tensile props., -196°-200°C 3=6800
- Cd₂As₂, Cu doped, elec. props. analysis 3=2906
- Cd-CdS liquids, 700°-1250°K 3=19063
- CdCl, phosphor, sulphide activated 3=950
- Cd₂Cl(PO₃)₂·3Mn, luminescence 3=13200
- CdD, u.v. band system 3=2612
- CdF₂, conversion from insulator to semiconductor 3=8522
- CdF₂, crystal spin-lattice relax. of Yb³⁺, 2-77°K 3=18138
- CdF₂, growth of highly-perfect single crystals for masers 3=23397
- CdF₂ single crystals, pure and rare-earth-doped, growth and opt. spectra 3=3003
- CdGeAs₂, conductivity, thermal, 100-700°K 3=20118
- CdGeAs₂, thermoelec. power, resist., Hall const., thermal cond. and diffusivity 3=8518
- CdH, u.v. band system 3=2612
- Cd_xHg_{1-x}Te alloys, optical and elec. props 3=10938
- CdI₂, aerosols, phase changes 3=1402
- CdI₂, amine complex, structure, moments 3=15358
- CdI₂, thermal decomposition along dislocations 3=17719
- CdIn₂Se₄, crystal structure and electrical properties 3=25350
- CdIn₂Se₄ semiconductor, prep. and props. 3=864
- CdIn₂Te₄, crystal structure and electrical properties 3=25350
- CdIn₂Te₄ semiconductor, prep. and props. 3=864
- Cd-Mg, order-disorder transformation 3=16103
- Cd-Mg, tensile props., -196°-200°C 3=6800
- Cd(NO₃)₂·4H₂O, crystals unit cell and space group, by X-ray diffr. 3=16084
- CdO crystal growth 3=11227
- CdO films, elec. and optical props. 3=25359
- Cd(OH)₂, films, thin, electrocrystallization 3=16170
- Cd oxide pressed powders with excess Cd or O, thermoelectricity, conductivity, electrical 3=22940
- CdS acoustic wave amplification, by electron-phonon interaction 3=20092
- CdS, Au blocking contacts to, at high impressed fields 3=22968
- CdS bound excitons 3=10630
- CdS, bound exciton complexes, opt. props. 3=6651
- CdS, coherent Bragg scattering of neutrons 3=1312
- CdS, crystal exciton spectrum, lattice deformation effects 3=22688
- CdS crystal excitons, spectra 3=22689
- CdS, crystal growth 3=20791
- CdS, crystal growth, on silica and quartz 3=16041
- CdS, crystal stacking faults, wurzite ribbon, X-ray exam. 3=15500
- CdS, crystal structure, high-pressure 3=23443
- CdS, crystallization 3=18258
- CdS crystals, electric breakdown, cine recording methods 3=1845
- CdS crystals, luminescence 3=13202
- CdS crystals, plasma-type space-charge oscillations 3=783
- CdS crystals, refractive index 3=13152
- CdS:Cu, Ga, photosensitive centre, e.s.r. study 3=23224
- CdS:Cu, ultrasonic transducer with diffused layer 3=9566
- CdS, current impulses due to α -particles 3=6594
- CdS, d.c. electroluminescence 3=11007
- CdS, dark polarization 3=20404

Cadmium compounds—contd

- CdS diodes, injection currents, space charge limited pulse and d.c. 3=15602
 CdS, dislocations, etching obs. technique 3=8439
 CdS, dispersion and exciton absorption band shape 3=18000
 CdS, dissociation energy $D_0 \leq 47$ kcal/mole 3=25806
 CdS, donor imperfections rel. to hybrid Frenkel-type disorders 3=2788
 CdS, double-acceptor defect by electron irradiation 3=25268
 CdS, double acceptor luminescence 3=15704
 CdS, drift mobility of electrons and holes, 500-80°K 3=4918
 CdS, e.s.r. of Cr^{3+} , 1.4°K 3=23226
 CdS, edge dislocations, calc. from Frank's formula 3=2792
 CdS, edge emission and elec. cond. rel. to pressure (up to 12 000 kg cm⁻²) 3=931
 CdS, edge emission line, temp. depend. 3=25480
 CdS, effect of pressure on elec. cond. 3=15588
 CdS, elec. cond. thermally stimulated, elec. field effect 3=6592
 CdS, elec. and photoelectric props., effect of neutron irradiation 3=4917
 CdS, electrical conductivity and Hall effect 3=25360
 CdS, electro and photoluminescence spectra, comparison 3=8632
 CdS, electroelastic props., meas. and model 3=8556
 CdS, electroluminescence, injection, 1.3V 3=15719
 CdS, electroluminescence, review 3=13220
 CdS, electroluminescence, single crystals, 3=13219
 CdS, electron bombarded, energy transport processes 3=13072
 CdS, electron emission, field, dark, temp. var. 15-500°K, annealed and e bombarded 3=19300
 CdS, electron emission, field, thermally stimulated, 20-200°K 3=19299
 CdS, electron emission, nonequilibrium 3=16971
 CdS, electron intensity meas. from conductivity effect 3=4198
 CdS, excess Cd incorporation, annealing effect 3=11262
 CdS, excitons, Bose-Einstein condensation 3=6498
 CdS, field emission, energy spectrum 3=21852
 CdS, films, crystallinity and electronic props. 3=22941
 CdS, films, current noise 3=25361
 CdS films, recrystallizing technique 3=23396
 CdS, fluorescence, blue and green, by u.v. excitation, 4.2° and 77°K 3=949
 CdS, fluorescence, use in optical maser 3=526
 CdS, galvanomagnetic effects and carrier props. 3=8523
 CdS, γ -ray induced conductivity 3=2908
 CdS, γ -ray photoconducting 3=6629
 CdS, growth velocity, effect on form 3=25672
 CdS, high-pressure phase structure 3=20834
 CdS, hole injection from Cu_2S 3=25382
 CdS, i.r. absorption spectrum, phonon peaks 3=10947
 CdS i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
 CdS, impurity states, electron-phonon coupling 3=10733
 CdS, In diffusion in electric fields 3=13052
 CdS, large crystals, growth and props. 3=17704
 CdS, long-wavelength photosensitivity, rel. to heat treatment 3=17954
 CdS, luminescence, cathodo 3=23118
 CdS, luminescence excitatn. by ions 3=970
 CdS, luminescence, exciton stimulation 3=10986
 CdS, luminescence: i.r. effect and anti-Stokes emission 3=3049
 CdS, luminescence rel. to temp., photochem. 3=15705
 CdS, n-type, lightly doped, Hall mobility 3=863
 CdS, n-type, u.v. excitn., photo e.m.f. 3=2974
 CdS, negative photoconductivity 3=903
 CdS, non-ohmic cond., rel. to u.s. amplification 3=12919
 CdS, optical absorption, 4.2°K, and excitons 3=8594
 CdS, optical props, 0.4-18 μ , impurity effects 3=20469
 CdS, photochemical reactions 3=3407
 CdS, photocond. of cubic and hexagonal crystals 3=6631
 CdS, photocond. props. 3=23395
 CdS, photocond. spectrum, modulated excitation 3=23012

Cadmium compounds—contd

- CdS, photoconductivity, increase near In, Ga contacts 3=17956
 CdS, photocurrent, effect of shadow region 3=13131
 CdS, photocurrents at ohmic contacts 3=17953
 CdS, photoelectric emission, nonequilibrium, and photoconductivity 3=19308
 CdS, photoelectron trapping coefficient β determination 3=13130
 CdS, photoelectronic props., with high impurity concn. 3=906
 CdS, photovoltage model 3=25421
 CdS, photovoltaic effects at Ohmic contacts 3=8569
 CdS, photovoltaic emission from Au and Cu 3=23013
 CdS, photovoltaic potentials with metal-film coatings 3=907
 CdS, polycryst. films, photoconductivity 3=904
 CdS, polycryst., photoconductivity carriers 3=905
 CdS, polymorphism 3=18233
 CdS, reflection bands, dispersion effect 3=15652
 CdS, reflection spectrum of wurtzite structure 3=8583
 CdS_xSe_{1-x}, photo-e.m.f., vert. illum., spectrum, var. with x 3=23015
 CdS, semiconducting, electrical pot. distrib. 3=17872
 CdS, single crystals, introducing additives during growth 3=23395
 CdS single crystals, mag. susceptibility 3=4998
 CdS, solubility of ZnSe and ZnTe 3=4886
 CdS, space-charge-limited current, expt. 3=861
 CdS, space charge limited current, noise 3=8520
 CdS, space-charge-limited currents 3=25362
 CdS, space-charge-limited currents, modulation 3=862
 CdS, space-charge limited injection currents 3=2907
 CdS, sphalerite form, elastic moduli 3=18159
 CdS, stacking faults 3=808
 CdS, stacking faults 3=17769
 CdS, strong acoustoelectric effect, due to piezoelectric coupling 3=8567
 CdS, surface studies by electron micr. 3=8924
 CdS, thin films, elec. cond., rel. to temp. 3=25363
 CdS, trapped space charge, thermal release 3=4949
 CdS, trapping level meas., electrical 3=20326
 CdS, trapping levels, fast, meas. from photocond. 3=17846
 CdS, trapping-state spectroscopy 3=23101
 CdS, true photoconductivity 3=17955
 CdS, u.v. luminescence, photochem. effects 3=3037
 CdS, X-ray spectrum short wave limit 3=4919
 CdS:Ag, photoconductivity 3=20394
 CdS-CdSe photoconductors, transient effects 3=2972
 CdSb, anisotropy of chemical bond 3=25649
 CdSb, band structure 3=10811
 CdSb, elec. and thermal props. 3=2740
 CdSb, elec. and thermoelec. props. 3=17971
 CdSb, electron states 3=17685
 CdSb, i.r. absorption, pleochroism 3=923
 CdSb, impurity effects on elec., thermoelec. props. 3=20325
 CdSb, semiconducting conductivity, Hall effect, temp. var., carrier mobility 3=25358
 CdSb, semiconducting, electron states, extremal points, dispersion 3=17684
 CdSb, semiconducting props., 2.4-4.2°K 3=25356
 CdSb, zone melting and refining 3=5087
 CdSe, conduct. induced by electron irradiation 3=17873
 CdSe crystals, Cu compensated, oscillations 3=2936
 CdSe, dislocations, etching obs. 3=3262
 CdSe, e.s.r. of Mn^{2+} and covalency 3=11115
 CdSe, electroelastic props., meas. and model 3=8556
 CdSe, exciton lines and lattice defects 3=6652
 CdSe, excitons, Bose-Einstein condensation 3=6498
 CdSe, excitons, reflection spectrum 3=20441
 CdSe, films, contact potl., light-induced changes, wavelength depend. 3=23014
 CdSe, films, crystal structure, on (110), (100) rocksalt faces 3=18378
 CdSe, frequency mixing of ruby laser axial modes 3=9970
 CdSe, γ -ray induced conductivity 3=2908
 CdSe, high-pressure phase structure 3=20834
 CdSe layers, elec. cond. due to electron irradiation 3=2910
 CdSe, melting and polymorphic transitions 3=16016

Cadmium compounds — contd

- CdSe, negative photodiode effect, 20° and -180°C 3=10889
 CdSe, nonequib. electron emission 3=21853
 CdSe, optical props. rel. to Ga-doping 3=915
 CdSe, photoconductivity 3=10888
 CdSe, polymorphism 3=18233
 CdSe prep. by reaction of components 3=25823
 CdSe, reflection spectrum of wurtzite structure 3=8583
 CdSe, solid state—vapour phase equil. 3=20977
 CdSe, surface interact. with O₂, meas. 3=11326
 CdSe—CdCl₂, phase diagrams 3=13590
 CdSe—HgSe, film formation and semicond. props. 3=2882
 CdSe: Mn, spin resonance, 3a cubic fld. splittings 3=1192
 Cd—Sn alloy density variation under thermal cycling, to 250°C 3=6868
 CdSnAs₂, CdSnAs₂—InAs solid solutions, magnetothermal and thermoelec. effects 3=17970
 CdSnAs₂, conduction band, calc. 3=17871
 CdSnAs₂, conductivity, thermal, 100–700°K 3=20118
 CdSnAs₂, n-type semicond, props. 3=4920
 CdSnAs₂, thermoelec. power, resist., Hall const., thermal cond. and diffusivity 3=8518
 CdSnAs₂—InAs alloys, elec. props. 3=2915
 CdTe, crystal growth from vapour, patterns 3=18259
 CdTe, crystal structure, high-pressure 3=23443
 CdTe, diffusion with HgTe 3=17786
 CdTe, dislocations, two types 3=10664
 CdTe, double acceptor defect 3=17874
 CdTe, double-acceptor defect by electron irradi. 3=25268
 CdTe, double acceptor luminescence 3=15704
 CdTe, e.s.r. of Cr 3=20646
 CdTe, effective electron mass and i.r. props. 3=10812
 CdTe, electroelastic props., meas. and model 3=8556
 CdTe evap. films, photovoltaic effect, high voltage 3=2973
 CdTe, excitons, reflection spectrum 3=20441
 CdTe films, evap., elec. props. and structure 3=23508
 CdTe, films, photocond., effect of additives 3=20407
 CdTe films, photoelectric e.m.f., "single crystal" 3=17957
 CdTe, growth of single crystals from melt 3=1267
 CdTe, high-field electron emission 3=421
 CdTe, high-voltage photovoltaic effect in evap. films 3=2973
 CdTe, impurity photoconductivity 3=15628
 CdTe, lattice distortion by Mn²⁺, e.s.r. det. 3=25167
 CdTe, melting and polymorphic transitions 3=16016
 CdTe, monocrystalline films, structure on mica and NaCl 3=20944
 CdTe, n.m.r. of Te¹²⁵, Cd^{111,113}, chemical shift 3=3202
 CdTe, n-type, elec. transport meas. 3=8519
 CdTe, n-type, Fermi level position meas. 3=2758
 CdTe, optical refl. and absorpt. props. 3=23067
 CdTe, p-type, diffusion of In 3=22806
 CdTe, reflectivity and band structure 3=17979
 CdTe solar cells, description 3=20420
 CdTe, solid—vapour equil., ΔH° and ΔS° 3=1877
 CdTe thermal expansion, anomalous negative low-temp. values 3=10603
 CdTe, thermal resistance, fall nr. Debye temp. 3=17670
 CdTe, valence band, l.c.b.o. method 3=779
 CdTe, X-ray L-absorpt. spectrum 3=25472
 CdTe, X-ray spectrum short wave limit 3=4919
 CdTiO₃, internal electric fields 3=12903
 CdTiO₃, Ti X-ray spectra, emission, bond type and Kβ₁ line changes 3=23092
 Cd—Zn alloy density variation under thermal cycling, to 250°C 3=6868
 (Cd,Zn)S layers, photoconductivity 3=23016
 Cd₂Ta₂O₇, use as reactor control material 3=4699
 CdTe—HgTe, film formation and semicond. props. 3=2882
 Cd_xHg_{1-x}Te solid solution, absorption and photomagnetic effect spectra rel. to composition 3=17997
 CdWO₄, e.s.r. and spin Hamiltonian of Fe³⁺ 3=5040
 (Zn, Cd)S : Cu phosphors, crystal structure, atomic, X, γ-ray effects 3=23457

Caesium

- atom, collision with slow electrons and Cs⁺ 3=4724
 atom, elastic scatt. of slow electrons 3=12776

Caesium — contd

- atom, elastic slow-electron scatt., adiabatic model 3=25064
 atom, elec. charge, upper limit 3=10091
 atomic beam scattering on Hg crossed beam 3=2586
 atomic model, for ionization transients 3=24219
 atoms, Cs¹³³I, spectrum, 8²P_{3/2} term, h.f.s. and lifetime 3=10451
 atoms, in plasma, Stark broadening of isolated lines 3=701
 atoms, i.r. emission 3=12756
 de Haas—van Alphen effect, period var. 3=20557
 desorption from W by elec. fields 3=3361
 diode converter, efficiency analysis 3=3999
 diode, mag. field effect 3=19166
 diode, with electron and ion emitters 3=9848
 discharge column without self-propagating power in mag. field, theory 3=4035
 films, photoelectric photoelectric properties rel. to temp. and thickness 3=15550
 ion scatt. process by Mo metal 3=22854
 ions, Cs¹³⁷, range in Al 3=12608
 ions, Cs⁺, scattering on hot Mo 3=2047
 liquid, heat capacity calc. up to 800°C 3=23870
 NH₃ soln., e.s.r., effect of adding CsI 3=11811
 optical pumping light source 3=16761
 plasma, conductivity, electrical, effect of electrode film barriers 3=21820
 plasma, disintegrating, volume recombination 3=24278
 plasma, electron mobility, scatt. cross-sections 3=12186
 plasma, quiescent, steady-state generation 3=4107
 plasma, recomb., electron—ion, higher densities 3=21821
 spectrum, absorption, in hydrocarbon vapours 3=22478
 thermoelectricity, electron and phonon scatt. 3=23027
 vacuum deposition 3=11844
 vapour diode, thermionic emission 3=14628
 vapour, elec. cond. meas., temp. depend. 3=23939
 vapour, ionization in shock tubes 3=1930
 vapour pressure measurement 3=19076
 Cs⁺—Cs atom charge transfer, 50–4000 eV meas. 3=5629
 Cs—He transient discharge, ionization 3=9727
 Cs⁺, desorption from Re 3=8930
 Cs¹³⁴, det. of traces in Na, K salts 3=11368
 Cs¹³⁷ level in biosphere, Toronto 1961–2 3=23604
- Caesium compounds**
 halides, diffusion of X₂, prod. by n irradi. 3=15508
 CsAu, resistivity, Hall const., Seebeck coeff. 3=20328
 CsBeF₃, crystal structure, atomic 3=20847
 CsBr, colloid absorpt. band at 1050 mμ 3=25451
 CsBr, equation of state, Grüneisen approx., temp. var., calc. 3=20115
 CsBr moving edge dislocations 3=10654
 CsBr, n.m.r. of Br^{79,81} 3=14185
 CsBr, Raman scatt. meas. 3=15692
 CsCl, decomposition by electron irradi. 3=17809
 CsCl, exoelectron emission spectrum 3=14618
 CsCl, K-absorpt. spectrum of Cl 3=6660
 CsCl, secondary emission, by K ions 3=16978
 CsCl type crystals, lattice 3=20079
 CsCl type solid solutions, heat of formation 3=18230
 CsClO₄, X-ray K-absorpt. spectra of Cl 3=20498
 Cs cyanoplatinate, as γ-scintillator 3=6668
 CsF, absorption spectrum, after X-irradiation, 295, 80, 18°K 3=15676
 Cs halides, F-centre spectrum, rel. to crystal structure 3=20242
 CsI, dislocations, observation by etching 3=22791
 CsI, far i.r., absorptn. at liquid He temps. 3=3006
 CsI, moving edge dislocations 3=10654
 CsI, quantum-mech. box model 3=4796
 CsI:Tl crystals, (n,p), (n,d), (n,α) reactions, 14.6 MeV 3=12689
 CsI:Tl, electroluminescence in film 3=11006
 CsI : Tl, film, 1 μm, electroluminescence 3=20541
 CsI : Tl, intracentre luminescence 3=945
 CsI:Tl, luminescence, decay time meas. 3=10005
 CsI : Tl, scintillation process 3=20506–7
 CsI : Tl, X-ray and γ-ray fluorescence 3=13215
 CsNO₃, fused, transport number of Cs⁺ ion 3=3796
 CsNO₃, fused, transport numbers 3=16172

Caesium compounds —contd

- Cs oxide cathodes, i.r. irradi., fatigue effects 3=2018
- Cs—Sb film, photoelectrons, ang. distrib. 3=19313
- Cs—Sb films, elec. cond. and photoemission 3=8495
- Cs—Sb layers, thermoelectric, resistive and photoelectric characts., var. with Cs content 3=8574
- Cs,Sb, film, photoelectric emission, effect of n irradiation 3=14632

Calcium

- atom, Ca I 4227 Å resonance line, oscillator strength 3=19932
- atomic beams, surface ionization, from W 3=24226
- $4^3\text{P}-n^3\text{D}$ and $3^3\text{D}-n^3\text{F}$ limit continua 3=12758
- coprecipitation with U and Th oxalates 3=1275
- ionization, Auger effect 3=12069
- orthogonalized plane wave form factors 3=25229
- Ca I spectrum, $4s4p^3\text{P}_1$ term, g_γ factor 3=2564
- Ni—C, crystallization, effect on, as impurity 3=16115

Calcium compounds

- acetate, in soln., dissoc. rate, from u.s. absorpt., errata 3=5439
- alloys, superconductivity 3=16873
- aluminates, hydrated, i.r. spectra, and H_2O behaviour 3=13165
- anhydrite (CaSO_4), crystal structure redetermination 3=25717
- calcite, defect formation due to twinning² 3=22696
- calcite, maser, optical, third harmonic generation 3=12340
- calcite, paramag. resonance of Fe^{3+} impurity 3=15940
- calcite, structure of etch-pits 3=8802
- calcite, twin propag. vel. when stressed 3=4865
- fluorspar, luminescence 3=8616
- gypsum dehydration study 3=25287
- gypsum, dielec. anisotropy in 3 cm microwave band 3=25391
- gypsum hemihydrate, mechanical strength and induction period of structure formation 3=8790
- gypsum panels, acoustic radiation efficiency 3=7300
- halides, spin—orbital splitting of F-centre band 3=13010
- hydrosilicates, nuclear mag. resonance 3=6767
- hydroxide, nuclear mag. resonance 3=6767
- limestone, elastic props. invest., in situ 3=9003
- mono-carboaluminate, i.r. spectra, and H_2O behaviour 3=13165
- montmorillonite- NH_4Cl system, ion exchange 3=11364
- Portland cement paste, dielectric measurements 3=22982
- vaterite (CaCO_3), lattice consts., from X-ray and optical data 3=25727
- X-ray K absorption, influence of charge on Ca ion 3=8273
- Ca tungstate, grown-in dislocations 3=22770
- CaAg, crystal structure, rel. to similar types 3=18338
- CaB_2O_4 , crystal structure 3=13467
- CaB_6 , semiconducting props. and electron requirements 3=8330
- $\text{Ca}_2\text{B}_6\text{O}_{11}\cdot 5\text{H}_2\text{O}$, ferroelec., internal biasing fields 3=20383
- CaBr , n.m.r. of $\text{Br}^{79,81}$ 3=14185
- CaC_2 neutron diffract. & paramag. scatt. analyses 3=1328
- CaCO_3 , aragonite and calcite modifications, out-of-plane bending of the CO_3 ion 3=25189
- CaCO_3 (calcite), electrode potential 3=8968
- CaCO_3 dislocations due to twinning 3=12971
- CaCO_3 , elastic consts. from velo., u.s. 3=23278
- CaCO_3 , elastic twinning kinetics 3=3260
- CaCO_3 (Iceland spar), photoelec. emission after crushing and coloration 3=14634
- CaCO_3 , specific heat, 1.6° to 70°K , rel. to antiferromag. transition 3=17659
- CaCO_3 , twin lamella, dislocs. 3=12982
- CaCO_3 , u.s. internal conical refraction 3=21500
- CaF_2 , absorption, light, additively coloured, i.r. 3=20470
- CaF_2 , adsorption of water vapour 3=1381
- CaF_2 , colouration spectra 3=2837
- CaF_2 , damage by sliding and wear 3=11189
- CaF_2 , decomposition, electron irradi. in micro-scope 3=21004
- CaF_2 , dissociation energy meas. 3=21638
- CaF_2 , doped, microwave u.s. spin—phonon interactions 3=23242

Calcium compounds—contd

- CaF_2 , elastic and thermoelastic props. 3=18161
- CaF_2 , e.s.r. of Gd^{3+} 3=15943
- CaF_2 , e.s.r. of Ho^{3+} meas. 3=13301
- CaF_2 , e.s.r. of rare earth ions 3=3172
- CaF_2 , e.s.r. of U^{3+} , orthorhombic spectrum 3=20658
- CaF_2 , e.s.r. of U^{4+} , charge compensation 3=3180
- CaF_2 films, structure from optical consts., adsorption formation theory 3=13560
- CaF_2 (fluorite), photoelec. emission after crushing and coloration 3=14634
- CaF_2 , fluorite, solubility in aq. electrolytes 3=23874
- CaF_2 , fused bath, electronic & ionic conductance, 1100°C 3=1394
- CaF_2 , F^{19} n.m.r., analysis by lattice harmonics 3=5047
- CaF_2 , F^{19} n.m.r. in r.f. field 3=3188
- CaF_2 , growth of highly-perfect single crystals for masers 3=23397
- CaF_2 , hardness rosettes and impression shapes 3=16009
- CaF_2 , high-purity crystals, coloration 3=6541
- CaF_2 , with impurity valence changes, e.s.r. 3=1180
- CaF_2 , photoconductivity, in electric fields 3=20406
- CaF_2 , radiationless transitions of Sm^{2+} 3=6646
- CaF_2 , sublimation pressures meas. 3=21638
- CaF_2 , as substrate for Ge films 3=23416
- CaF_2 , surface energy of $\{110\}$ face 3=22632
- CaF_2 thin films, absorpt. edge, temp. depend. 3=3002
- CaF_2 , vapour pressure and heat of sublimation 3=12007
- $\text{CaF}_2:\text{Dy}^{3+}$ fluoresc. rel. to crystal field levels 3=25481
- $\text{CaF}_2:\text{Dy}^{2+}$, maser, optical, sun pumped, liquid Ne temp., $2.36\ \mu$, 3=17088
- CaF_2 , Er^{3+} and Yb^{3+} absorption and luminescence spectra 3=3000
- $\text{CaF}_2:\text{Er}^{3+}$, multistage radiative transitions 3=18027
- CaF_2 , Eu-doped, e.s.r. absorption of $9.3\ \text{kMc/s}$ phonons 3=1190
- CaF_2 , Eu^{2+} , Sm^{3+} impurities, electron phototransfer 3=951
- $\text{CaF}_2:\text{Eu}^{2+}$ (0.01%) crystal, Zeeman effect, $4130\ \text{\AA}$, 4.2°K 3=17983
- $\text{CaF}_2(\text{Eu}^{2+})$, Zeeman and uniaxial stress spectra 3=10943
- $\text{CaF}_2:\text{Ho}$, impurity in behaviour, e.s.r. and optical study 3=8710
- $\text{CaF}_2:\text{Mn}$, decay of cathodoluminescence 3=3066
- $\text{CaF}_2:\text{Mn}$, thermoluminescence temp., Mn, Cl ions, var. 3=23127
- $\text{CaF}_2:\text{Pr}^{3+}$, fluorescence due to X-rays 3=953
- $\text{CaF}_2:\text{Sm}^{2+}$, absorption and luminescence spectra, Zeeman effect 3=18026
- $\text{CaF}_2:\text{Sm}^{2+}$, n.m.r. of F^{19} , diffusion narrowing 3=23271
- $\text{CaF}_2:\text{Sm}^{2+}$, non-radiative transition calc. 3=20124
- $\text{CaF}_2:\text{Sm}^{3+}$, fluorescent spectra 3=13203
- CaF_2 , Tm^{3+} e.s.r. $9250\ \text{Mc/s}$, $4.2^\circ-60^\circ\text{K}$ 3=18134
- $\text{CaF}_2:\text{Tm}^{3+}$, fluoresc. selection rules 3=13204
- CaF_2 , Tm^{3+} e.s.r. $9250\ \text{Mc/s}$, $4.2^\circ-60^\circ\text{K}$ 3=18134
- CaF_2 , U-activated, luminescence; "relaxation spectra" 3=3035
- $\text{CaF}_2:\text{Y}^{3+}$, optical and e.s.r. spectra 3=15516
- $\text{CaF}_2:\text{Y}$, X-irradi., colouration spectrum 3=8593
- $\text{CaF}_2:\text{Nd}^{3+}$, crystal field splitting 3=13167
- Ca fluorophosphate, absorpt. spectrum of Mn^{2+} impurity 3=13168
- $\text{Ca}_3(\text{Fe}_{1-x}\text{Al}_x)_2\text{O}_{10}$ solid solutions, crystal structure rel. to comp. 3=1340
- CaGe, crystal structure, rel. to similar types 3=18338
- Ca_3GeO_8 , crystal structure, atomic 3=23373
- Ca_3GeO_8 , phase transformation temps., by thermal analysis 3=23373
- Ca halophosphate, Mn, Sb-activ., luminescence 3=3038
- Ca halophosphates, colour centres 3=22834
- Ca hydrosilicate with sorbed water, n.m.r. study 3=11127
- $\text{CaMgB}_6\text{O}_{11}\cdot 6\text{H}_2\text{O} = \text{CaMg}[\text{B}_6\text{O}_{10}(\text{OH})_2]_2\cdot 3\text{H}_2\text{O}$ crystal structure 3=8861
- $\text{CaMgSi}_2\text{O}_6$, diopside melting curves rel. to pressure 3=9657
- CaMoO_4 , luminescence, effect of SrO , BaO , ZnO , CdO inclusion 3=20508
- $\text{Ca}(\text{NO}_3)_4\cdot 4\text{H}_2\text{O}$ crystal unit cell, by X-ray diffr. 3=16084
- Ca orthophosphates, hydrogen bonding, X-ray diffr. and i.r. data 3=8865
- CaO-activated cathode, coloration 3=12234

Calcium compounds—contd

- CaO-Al₂O₃ mixture, heat of fusion 3=293
 CaO-B₂O₃ mixture, heat of fusion 3=293
 CaO, cathodoluminescence, vacuum u.v. 3=13178
 CaO, covalent bonding, evidence from e.s.r. data 3=25576
 CaO, e.s.r. of six metal ions 3=3181
 CaO, exoemission, luminescence 3=419
 CaO films, optical absorption, elec. cond., thermoelec. power 3=20471
 CaO, heat of sublimation 3=19075
 CaO, heat of vaporization, by mass spectr. 3=1875
 CaO, optical and e.s.r. spectra after neutron irradiation 3=13169
 CaO, oxygen treated, luminescence, electron excitation 3=15717
 CaO = Ca(gas) + O₂, mass spectr. meas. 3=3379
 CaO: Mn, Li phosphors, H₂ or N₂-fired 3=3039
 CaS, Mn activator incorporation 3=12965
 CaO-ZrO₂ solid solution, electrical conductivity, ionic 3=8550
 Ca(OH)₂, lattice energy levels by neutron scatt. 3=17643
 Ca phosphate phosphors, for lamps 3=972
 Ca₃(PO₄)₂(Cl,F):Sb, Mn, luminesc. 3=10991
 CaS, dielec. props. at 7.25 Mc/s 3=17932
 CaS, dissociation energy D₀ = 79.5 kcal/mole 3=25806
 CaSi, crystal structure, rel. to similar types 3=18338
 CaSn, crystal structure, rel. to similar types 3=18338
 CaSO₄, crystal structure 3=23453
 CaSO₄, S X-ray spectrum, K absorpt., Stark effect and excitons 3=23097
 CaSO₄, thermoluminescence rel. to exo-electron emission 3=2013
 CaSO₄.2H₂O, dielectric const., 8 mm, by shorted-line waveguide 3=22973
 CaSO₄.2H₂O, monoclinic, vibration spectrum 3=23038
 CaSO₄.2H₂O, n.m.r. 3=8728
 CaSO₄-Sm thermoluminescence rel. to exo-electron emission 3=2013
 CaTiO₃, dielectric const. rel. to temp. 3=4945
 CaWO₄, cellular structure, grown from melt 3=25665
 CaWO₄, crystal field at Ca²⁺ site 3=12902
 CaWO₄, luminescence due to X-rays 3=4982
 CaWO₄, luminescence excitatn. by ions 3=970
 CaWO₄, Nd³⁺ fluorescence excitation 3=13199
 CaWO₄:Nd³⁺, laser action, harmonic generation and mixing with ruby beam 3=7359
 CaWO₄:Nd³⁺, maser oscill., 0.9 and 1.5 μ 3=25447
 β-Ca₂P₂O₇, crystals, growth by hydrothermal synthesis 3=6827
 Ca₂Y₄Si₄O₁₂[(CO₃)₂]H₂O, kinosite, unit cell and space group 3=13473
 Ca_xBa_{1-x}TiO₃, thermal and elec. props. 3=20122
 CaZrS₄, synthesis and crystal structure 3=8850

Calculating apparatus

See also Fourier analysis; X-ray crystallography, calculation apparatus.

- for bubble and spark chambers, counters, data processing 3=19519
 computers, in decision making, usefulness 3=5324
 fast group constants, variational procedure 3=25003
 lens design, automatic 3=16731
 pattern recognition 3=16489
 pattern recognizing, in cascade 3=16490
 programme for particle track kinematic analysis 3=19517
 programme, X-ray crystallography 3=6836
 spectrometer card punching comparator for wavelengths and wavenumbers 3=18997
 "Teleperm" for gas flow variables 3=5455

analogue apparatus

See also Nomograms; Sliderules.

- for Abel inversion of scanning photoelectric spectrometer signals, 3=14347
 for bubble chambers, unusual interaction vertices 3=19522
 crystals, electron states, bound, at boundaries, impurities, structural defects 3=17681
 cyclotron, AVF, orbits invest. by analogue computer 3=5768
 of discharge, Townsend 3=19201
 for electron ejection, Auger, from solid surfaces 3=14619
 electron-optical system, rubber membrane model 3=21874

Calculating apparatus—contd**analogue apparatus—contd**

- for gun trajectory tracer, electrolytic tank, including mag. fields and space charge 3=14655
 Hall effect divisor, InSb 3=13998
 i.r. filter analysis, modification 3=19011
 ion beam focusing, with multi-electrode system, conductive paper model 3=19366
 ionosphere, F-region, electron density 3=5219
 for n.m.r. spectra moments, calculation 3=12334
 nuclear reactor, fission, VVR-S, transient operation 3=25022
 nuclear reactors, transistorized computer 3=4685
 optical contrast transfer functions calc. 3=11891
 particle track recognition 3=19516
 for propellant optimization, stoichiometric 3=16470
 reactor transients simulation 3=22455
 for semiconductors, potential distrib. 3=17907
 for sound absorbers with non-rigid supports 3=9572
 wide-band electronic integrator 3=24168

differential analysers

No entries this year

digital computers

- accelerators, orbit stability programme 3=5769
 bubble-chamber Hough-Powell flying spot digitizater program 3=24562
 for bubble chamber scanning measuring projector 3=19520
 computer-controlled X-ray diffractometer 3=23425
 for crystal structure analysis, conference, Moscow 1961 3=16063
 cyclotron, AVF, programmes for field shape, trimming coils calc. 3=5767
 cyclotron orbit calc., three programmes 3=5763
 cyclotron programmes for small computer 3=5770
 cyclotron trim-coil currents, calc., linear programming methods 3=5765-6
 data processing, nuclear physics 3=5325
 DEUCE, analysis of random fluctuations 3=14
 diatomic mols., electronic energies calc. 3=19970
 diffractometer programmes, crystal structure det. 3=25684
 Elea 9000, crystallographic programme 3=3294
 ferrite cores as storage elements 3=23175
 ferromagnetic films as storage elements 3=23175
 film memory devices, effect of skew 3=14734
 films, thin Sn, switching elements 3=13562
 for filtering of spectrophotometric noise 3=11913
 for Fresnel diffraction patterns of finite line grating 3=24053
 generalized quota sampling 3=11670
 geophysical prospecting, γ-ray log, analysis for U₂O₈ 3=21027
 IBM 1620, crystallographic programmes 3=3295
 iterative computation, on electron guns, high-perveance 3=5700
 magnetic computer memories, review 3=14729
 magnetic film memories, drive current margins 3=14730
 magnetic lens focusing properties, Monte Carlo technique 3=19342
 magnetic storminess calc., for high-lat. observatories 3=18571
 magnetic thin film matrices, parameters meas. 3=4248
 memory read-only device, thick-film 3=14733
 ORIC mag. fields design, computer programmes 3=5764
 particle accelerator instrumentation 3=24178
 pattern recognizer, for bubble chamber negatives 3=19521
 photographic emulsions as storage media 3=11962
 physics independent study course, use in 3=11657
 pitch extraction from speech signals 3=11620
 programme for beam transport magnet optimization 3=16986
 programme for calc. nuclear reactor period meter, fed from ionization chamber, tune response during startup transients 3=12741
 programme for calc. nuclear reactor period meter, fed from pulse counter, time response during startup transients 3=12742
 programme, crystallographic, powder pattern reduced quadratic form 3=23433

Calculating apparatus — contd**digital computers — contd**

- programme, earth, vibration, free spheroidal, long-period 3=18468-9
- programme for semiautomatic lens design 3=14311/2
- programme, X-ray crystallography, Fourier analysis, computer programme 3=23435
- programmes, bubble chamber data processing 3=19518
- programmes, for X-ray crystallography, U.S.S.R., survey 3=20831
- QUEST, on-line event processing routine 3=7091
- random-access store, use of Crowe cell 3=340
- reactor computations, 106 codes 3=17508
- resonance due to "s" neutrons, time-of-flight transmission expts., computer anal. 3=12469
- simulation of sampled-data voice-excited vocoder 3=25999
- stars, binary, visual, orbits 3=5261
- TIMTAPE, analysis of random fluctuations 3=14
- traces calc. for Dirac γ -matrices, 3=16488
- use in microstructure examination 3=13586
- use for speech analysis 3=9291
- waffle iron memory structure 3=14731

Calculation

See also Graphs; Monograms.

- angular distribution, comparison with experiment 3=24880
- extrapolation, reliability, over long periods 3=5327
- fast group constants, variational procedure 3=25003
- finite-difference method for e.m. guided waves 3=14773
- integral equations of potential theory, digital computation 3=23734
- Lorentz group, homogeneous, infinitesimal operators, simplified method 3=13
- molecules, simple, electronic states and spectra, by computer 3=10500
- Monte Carlo, bimolecular exchange reactions 3=25811
- Monte Carlo, quota sampling 3=11670
- observation sequences, average lagged product/cross spectrum relationship 3=21199
- percolation problems in lattices, Monte Carlo method 3=13997
- potential fields, vertical derivatives, second order, numerical methods 3=18696
- programme, earth, vibration, free spheroidal, long-period 3=18468-9

Calculus

See Differential equations; Integrals; Mathematics.

Californium

No entries this year

Californium compounds

No entries this year

Calorimeters

- adiabatic "heating-up" [aufheiz] 3=11989
- adiabatic, for heats of alloying meas. 3=24097
- adiabatic, for specific heats 50°-650°C 3=16831
- automatic adiabatic soln. cal., thermistor controlled 3=24095
- high temp., enthalpy meas. 3=25198
- isochronal differential microcalorimeter 3=21606
- isothermal, for reactor radiation dosimetry 3=696
- metal-block, rotatable, with thermoelec. meas. 3=21603
- for metals, alloys, in deformation, liquid-gas film 3=19058
- microcalorimeter, adiabatic, for radioactivity meas. 3=6188
- microcalorimeter, E. Calvert type, thermoelec. calibration. 3=3916
- microcalorimeter, millimeter-wave 3=12043
- microcalorimeters, high detectivity 3=19057
- Nernst-Eucken, for molar heats of solids, 10°K-290°K 3=21607
- for nuclear reactors, high radiation fields 3=12740

Calorimetry

See also Heat of adsorption, etc; Specific heat.

- bremstrahlung energy leakage 3=14950
- Fe, thermodynamic function derivation method 3=21604
- γ -dosimeter absolute calibration 3=574
- γ -ray calorimeter, mercury thermometer 3=7820
- heat exchange in adiabatic calorimeters, analysis 3=24096
- high temp. 3=9648
- liquid for masers, optical, high energy 3=9984
- microcalorimetric meas. of γ -radiation 3=10078

S 50a

Calorimetry — contd

- probe for gas meas., sensitivity 3=21605
- sputtered Au atoms, by Kr^+ , 10-1000 eV 3=5724
- thermograms, use, up to 1500°C 3=9649
- X-ray meas., ioniz. chamber, calibration 3=2151

Cameras

- astronomical, Schmidt, Cambridge, performance, astrometric 3=21082
- astronomical, Schmidt, plate adjustments, photographic and corrector 3=21081
- exploding ribbon blast shutter 3=11957
- 50,000 pictures/sec framing camera 3=11959
- jumping-film camera, for meteor photography 3=11488
- Schmidt camera for astrometry 3=9149
- shutter, fast-opening (<45 μ sec), large-aperture 3=14384
- ultrahigh-speed image-dissecting camera 3=3904
- X-ray spectroscopy, low-temp. 3=21921

Capillarity

See also Bubbles; Contact angle; Drops; Films, liquid; Foams; Surface tension.

- acoustic generator systems containing Hg droplets and electrolyte, on appl. a.c. 3=18911
- anomalies in very thin capillaries 3=7195
- chemical extraction, by diffusion, from capillary channels 3=6906
- contact angle, meas., corrosive liquids 3=14130
- contact angle meniscus props. 3=14134
- effect on water flow in canals 3=9431
- gases, pressure-temperature drops reln. 3=152
- gases, pressure-temperature drops reln. 3=5453
- raising of liquid undergoing u.s. vibs., temp. change 3=23855
- rise in assembly of identical spheres, calc. 3=122
- solutions, flow, exptl. re-evaluation 3=16597
- solutions of large molecules, solute velocity increase 3=113
- streaming potential rel. to zeta-potential 3=14179
- viscometers, kinetic energy correction term 3=109

Carbon

See also Diamonds; Graphite.

- amorphous, e.s.r. line-widths, rel. to O 3=3168
- anthracite, e.s.r. in strong fields 3=14787
- arc, cathode spots, hybrid 3=4070
- arc, spectral meas., visible and i.r., as radiation standard 3=21539
- arcs, magnetic contraction, at medium current intensities 3=7486
- atom, photoionization of lower excited states 3=25048
- atoms, electron scatt. on, differential and total elastic and inelastic cross-sections 3=21890
- atoms, spectral transition probabilities 3=702
- bonds, C^{13} -H, effect of substitution, methanes 3=20001
- carbonized anthracite aggregates, contact resistance 3=8545
- crystal growth, homogeneous and heterogeneous 3=18256
- crystal lattice structure, effect of heat treatment, pyro layers 3=20272
- crystal structure and diamag. props., heat treatment effects 3=20949
- diamagnetic props. and crystal structure, heat treatment effects 3=20949
- diffusion in Fe, Co, Ni, Ti, Ta, W, by electric fields 3=20236
- diffusion mobility in Fe, rel. to pressure 3=20234
- elastic scatt. of O^{16} ions 3=19891
- electrical properties, effect of heat treatment, pyro layers 3=20272
- electron emission, induced by laser beam 3=19304
- electron emission, secondary, by relativ. primaries 3=16979
- electron states, pregraphitic, π electrons 3=15457
- energy loss of 4-30 keV H^+ and He^+ 3=4394
- films, graphitization and deformation 3=13395
- films, prep. for electron microscopy 3=16137
- graphite, ion emission, secondary, on inert gas ion bombardment, 100-30000 eV 3=14865
- graphitized carbon black, adsorption of Ar 3=11324
- hexagonal polymorphism, possibility 3=3298
- ion, C^{13} , charge distrib. at high velocities 3=7447

S 50b

Carbon — contd

- ions, energy loss and effective charge in gases
at < 10 MeV/a.m.u. 3=1937
isotope separation, $C^{12}H_4$ — $C^{13}H_4$, enrichment coeff.
meas. 3=15307
mean free path of 10^{12} eV nucleons 3=24715
new phase above 150 kbar 3=18229
phase diagram 3=8793
precipitation in Fe—C alloys 3=6867
pregraphitic, paramagnetism 3=15759
proton scatt., elastic, polarization meas. 3=2444
replica films, structure examin. 3=3375
resin-bonded, piezoresistive effect 3=21288
resistivity rel. to pressure up to 3×10^6 kgm
cm⁻² 3=2902
solubility in Ni and Ni + Fe 3=5117
spectra in highly ionized state, meas. 3=10448
structure, black, particles, internal, and oxides 3=25804
in subdwarfs, effect on evolution 3=1526
tantalum-carbon system, field emission 3=14622
thermal diffusivity 3=14396
vapourization, by laser, 30 MW, photographic
obs. 3=21627
vitreous, preparation and use as crucible material 3=21181
wear rel. to elastic moduli of brush materials 3=20761
 $C + CCl \rightarrow C_2^* + Cl$, reaction, energy distribution 3=11346
 $C + CH \rightarrow C_2^* + H$ reaction, energy distribution 3=11346
 C^- , photodetachment spectrum 3=4003
 C_2 molecule, $A' \ ^2\Sigma^-X' \ ^4\Pi$ band system 3=8250
 C_2 molecule, Phillips system and mol. const. 3=8251
 C_2 spectrum, Swan bands 3=19975
 C_2, C_3, C_4 , mols., electronic density distrib., and
bonds 3=22540
 C^{12} prodn. rate in the burning process 3=12581
 C^{14} dating, background suppression 3=24538
 C^{14} in upper troposphere, Spring 1962. 3=25911

Carbon compounds

See also Organic compounds.

- carbonates, inorg., lattice frequ. and rotational
barriers 3=746
carbonyls, Group VI, phosphine-substit., i.r.
spectra 3=6397
carborundum, black, type III electroluminescence 3=3071
graphite bromide, Br layer removal, in vacuo, electron
microscope obs. 3=20175
graphitic oxide, oxygen atoms distrib. 3=5107
petroleum deposits, meteors as sources 3=9185
C bromide, Br layer removal, in vacuo, electron
microscope obs. 3=20175
CBr radical, absorption spectrum 3=25092
CBr₄, crystalline, vib. spectra 3=15677
CCl⁺ and CF⁺ spectra, really due to BF and BCl 3=8252
CCl₄ drops, internal circulations 3=14133
CCl₄, Raman lines, depolarization 3=732
CCl₄—aromatic complex formation 3=25814
CF₂, triple point temperature 3=132
CF, CF₂, spectra, absorpt., pre-dissociation 3=15345
CF₂Cl₂, liq., spin—lattice relax. of F 3=21409
CF₄, Raman intensities for $\nu_1(a_1)$ modes 3=22559
C₂F₄, vibr. energy transfer with CHF₃, CF₄
and SF₆ 3=6434
CH, CH₂, π^- at rest + p $\rightarrow \pi^0$ + n to stopped π , ratio 3=19677
C₄N₄⁺, mass spectroscopic obs. 3=21714
CN radicals, excited, microwave transitions, optical
detect. 3=6390
CN, A² Σ^+ and X² Σ^+ states, vibr.-rot. analysis 3=2611
CO, absorption bands of dense forms and solns. 3=17572
CO, abundance in ground level air 3=13664
CO, adsorption by Mo, films, 10^{-8} — 10^{-6} mm,
-195—+22°C 3=16146
CO, adsorption on Ba, ultra-high vacuum 3=5474
CO, adsorption on Cu 3=11322
CO, adsorption in graphite 3=13569
CO, adsorption on NiO, depletive 3=25781
CO, adsorption on Pt 3=13571
CO, adsorption on W, rel. to work function 3=18394
CO band spectra 3=10503
CO⁺ band spectra 3=10503
CO boiling point, detm. 3=9659

Carbon compounds — contd

- CO—CH₄ solution, heat of mixing and volume
change 3=1682
CO, CO₂, in M-type stars 3=11574
CO and CO₂, Townsend discharge, photon absorp-
tion 3=4029
CO crystals, librational motion 3=745
CO, diffusion in CO—CO and CO—N₂ systems 3=7232
CO, dissociation by electron impact, O⁻ prod. 3=361
CO, dissociative ionization by ion impact 3=21709
CO, electron interchange with H atom beam 3=6342
CO, field desorption and corrosion of W and Ir 3=18396
CO, flame bands 3=25091
CO⁺, Franck—Condon factors and r-centroids 3=4743
CO gas, vibrational relaxation 3=7243
CO, i.r. emission from Hg* \rightarrow CO electronic-
vibrational transfer 3=10506
CO, i.r. spectra of liq. and solid 3=1693
CO, ionization, mass spectrometric meas. 3=12070
CO ionization by protons, 0.15–1.1 MeV 3=4006
CO, isotope exchange with Ni(CO)₄ 3=3380
CO, line-strengths in 2–0 absorpt. band 3=4744
CO, liquid systems, binary, with N and Ar 3=132
CO molecule, excitation 3=10514
CO, as possible molecular beam frequency
standard 3=12882
CO, pure, diffusion C¹⁴O—C¹²O, thermal 3=14203
CO, pure rotational absorption lines 3=24019
CO, radiation spectrum, shock wave heated 3=11835
CO, reaction with O atoms 3=5159
CO, reactions with inert gases at high pressures 3=3387
CO, Raman spectra and mol. collisions 3=7247
CO, rotational line broadening by HCl and Ar 3=12817
CO, sorption on Cu, Au films, surface potential, diode
meas. 3=13602
CO, spectra, emission, excited by protons and H
atoms 3=15338
CO, spectral lines, foreign gas broadening. 3=173
CO on Ta, field emission 3=14623
CO⁺, u.v. excited, fluorescence 3=4753
CO, vibr.-rot. bands, foreign-gas broadening 3=9511
CO, vibr.-rot. bands, pressure broadening 3=9510
CO, vibrational energy exchange with N₂ 3=20031
CO, vibrational fluorescence 3=16665
CO, vibrational transition probabs. calc. 3=12803
CO₂, absorpt. in far i.r., collision-induced 3=23932
CO₂, adsorption and diffusion in "Aerosil"
silica 3=18399
CO₂, aq. soln., optical rotation, effect of circularly
polarized light 3=1688
CO₂, atmospheric fluctuations, due to sea property
changes. 3=25866
CO₂, atmospheric, rel. to large-scale mixing. 3=25867
CO₂ boiling and triple points, detm. 3=9659
CO₂, convection near critical pt. 3=21589
CO₂, diffusion of Kr⁸⁵ in dense gas 3=1720
CO₂ discharge, rel. to air corona 3=4046
CO₂, dissociation by electron impact, O⁻ prod. 3=361
CO₂, dissociation rate 3=15389
CO₂, effect of H₂ and D₂ on relaxation time 3=16658
CO, electron diffusion—mobility coeffs. ratio 3=4023
CO₂, electron diffusion—mobility coeffs. ratio 3=4023
CO₂, electron transport, time-of-flight meas. 3=23940
CO₂, gas flow, free-molecular, momentum transfer to
metal surfaces 3=5456
CO₂, gas, ν_3 fundamental at 1200°K, model 3=5467
CO₂, gas, thermal self-diffusion 3=11817
CO₂, ground state, extended basis-set LCSTO—MO—SCF
calc. 3=10528
CO₂—H₂O system, in turbulent motion, mass transfer,
conc. effect 3=16152
CO₂, i.r. absorption lines, 5.3–4.6 μ 3=19991
C₂O₂, i.r. absorption spectrum in Ar matrix 3=10527
CO₂, i.r. emissivity, 4.3 μ band 3=17584
C¹³O₂, i.r. spectra, rotational perturb. 3=6399–400
CO₂, intense beam prod. using nozzle 3=4790
CO₂, intermolec. forces and self-diffusion rel. to
temp. 3=20033
CO₂, molecular quadrupole moment 3=12835
CO₂, ν_3 , 4.3 μ absorption, 1200° to 2400°K 3=1731

Carbon compounds—contd

- CO₂ pulmonary diffusion, rel. to human cardiac output 3=3637
- CO₂, quadrupole moment 3=12841
- CO₂, radiation spectrum, shock wave heated 3=11835
- CO₂, radical, trapped, structure and spectra 3=6418
- CO₂, Raman spectra and mol. collisions 3=7247
- CO₂, refractivity, second virial coeff. 3=3835
- CO₂, sampler, high-volume, atmospheric, for radioactivity meas. 3=13690
- CO₂, spectra, emission, excited by protons and H atoms 3=15338
- CO₂, spectral absorption, rel. to Venus atmosphere 3=13865
- CO₂, spectrum, in atmosphere, weak telluric band 3=9045
- CO₂, spectrum, i.r. band excited by active N 3=25108
- CO₂, thermal cond. in crit. region 3=3833
- CO₂, thermal cond. in crit. region, measurement, 3=3834
- CO₂, total absorbance in i.r. 3=14216
- CO₂, vibration deactivation by collision 3=6441
- CO₂, vibrational relax., theory and expt. 3=22558
- CO₂, viscosity meas. 3=14189
- COCl₂, dielec. props of gas, liquid, solid. 3=177
- CO β -quinol clathrate, CO motion, 15°-100°K, from heat capacity 3=8284
- CS₂, absorption and afterglow spectra 3=11839
- CS₂ and bromoethane, photoionization, and Lyman- α detection 3=14416
- CS₂ ionization potential by photoelectron energy spectra 3=7434
- CS₂, liquid, i.r. absorpt. 3=3021
- CS₂, liquid, optical consts. from i.r. reflection 3=16624
- CS₂, mol. structure det. from moments of inertia 3=2597
- CS₂, solid, preparation and absorption spectrum 3=17999
- CS₂ ions prodn. by charge exchange with primary negative ions 3=7444

Catalysis

- See also Reaction kinetics.
- cracking, of cumol and paracumul, on Al₂O₃ or zeolites, effect of additives 3=20996
- 2-4-dinitrotoluene, photoisomerized, acid catal. of fading. 3=25836
- di-tertiary butyl peroxide, gas phase HCl-catalysed decomp. 3=5164
- epoxide splitting, base catalysis mechanism 3=20997
- ethylene oxide, first addition to phenol, base catalysis mechanism 3=20997
- films, solid, rel. to irradi. 3=6896
- gas-phase atom recombination, H atoms at high temp. 3=16165
- ionic, of H-atom recombination 3=16164
- nitrosohydroxylaminesulphonate ion, decomposition, acid catalysed, kinetics 3=20980
- phenol, first addition of ethylene oxide, base catalysis mechanism 3=20997
- probes for det. atom conc. in dissociating gas 3=18430
- propylene on incandescent Nb 3=13605
- Al₂O₃, action on adsorbed methanol and ethanol 3=3362
- by Ar, of O atom recombination 3=13595
- H on Ge films 3=3397
- NH₄NO₃, thermal decomposition, by NaCl 3=3398
- O⁻, recombination, on exposure to Ag surface 3=18442
- Sn, nucleation catalysis in supercooled liquid 3=1270

Cataphoresis

- See Electrophoresis

Cathode-ray tubes

- See Electron tubes.

Cathode rays

- See Electron beams.

Cathodes

- See also Electron emission; Thermionic emission.
- cathode spots in high-intensity discharge 3=21721
- crossed-field, in electron tubes 3=5699
- dielectric, photoelectric emission, X-ray 3=19311
- disintegration coeff. and focused collisions in mono-crystals 3=7658
- dispenser, after activation 3=12235
- dispenser, impregnated, activation process 3=4178
- elec. discharges, electron erosion, theory 3=9746

Cathodes — contd

- electrode curvature, effect on breakdown in vacuum 3=9759
 - electron emission near zero field 3=14617
 - erosion at negative point in corona discharge 3=4052
 - field emission, stable, vacuum conditions 3=420
 - fluorescence yield by X-ray photoeffect 3=6663
 - hairpin and point, geom. optical and electrical props. 3=24334
 - metal, photoelectric effect, X-ray, secondary emission effects 3=19310
 - thermionic, work function, surface distrib., electron mic. meas. 3=2010
 - thermionic, zero-field emission 3=423
 - thin film cold cathodes 3=12230
 - tunnel, thin-film sandwich, I-V characteristics rel. to sandwich voltage 3=5692
 - Al-Al₂O₃-Al tunnel, emission electron energy distrib., retarding-field meas. 3=19301
 - Ba, sublimation, meas. techniques and results 3=9830
 - Cu, surface material torn out in vacuo 3=12236
 - H₂ discharge tube, surface layers rel. to Townsend parameters 3=4033
 - In on InSb wafer, specimen geometry rel. to magnetoresistance 3=12237
 - Mo, in glow tubes characteristics 3=4054
 - Mo, rel. to Ne-Ar mixture breakdown 3=19221
 - Ni, crystal phases, relation to adhesion and emission 3=19131
 - Ni, rel. to Ne-Ar mixture breakdown 3=19221
 - Th-W, maser, optical, induced emission 3=19305
 - W arc cathodes 3=9755
 - W, electrically heated, transient characts. 3=14627
 - W, photoelec. emission, 10-50 eV 3=14631
 - W, thermionic emission, laser induced 3=21857
 - W, thoriated, anti-emission materials 3=9523
- oxide**
- activation, drift and diffusion processes 3=9831
 - alkaline-earths, products emitted when heated 3=4204
 - dispenser, activation, electron microscope obs. 3=19302
 - as plane electron source 3=9832
 - pulsed operation, temperature transients 3=21858
 - sputtering, by low-pres. discharge, rel. to temp. and geometry 3=7654
 - thermoelectric power, and conductivities, BaO, SrO, (BaSr)O 3=17969
 - Ba-Ni, emission mechanism, comparison with L 3=21861
 - BaO, (BaSr)O, thermoelectric power, and conductivities 3=17969
 - BaO, sublimation, meas. techniques and results 3=9830
 - Ca oxide activated, coloration 3=12234
 - Cs oxide, i.r. irradi., fatigue effects 3=2018
 - on Ni cores, thermoelec. power 3=25426
 - MgO, cold, electroluminescence, var. with current and temp. 3=20544
 - SrO-coated, photoelectric emission 3=12238
 - SrO, on O-Ni base, emissivity, var. with thickness 3=20439
 - SrO, (BaSr)O, thermoelectric power, and conductivities 3=17969
 - Th-W, saturated emission at high currents, meas. 3=19307

Cavitation

- See also Vortices.

- acoustic wave generator, to 500 W 3=229
- bubble collapse 3=16599
- bursts, velocity det. by acoustic method 3=5421
- explosion at surface of liquid 3=5422
- growth of u.s. (500 kc/s) generated cavitation 3=14121
- liquids, cavity formation and propagation, after wire explosion 3=118
- luminescence, u.s. induced 3=18819
- polymer solns., u.s. cavitation, degradation 3=23878
- sonoluminescence, heat loss from bubbles 3=18818
- transducers, limiting-factor in 3=23976
- ultrasonic 3=16594
- vibration-induction theory 3=23862
- wall-effects on collapse of bubbles 3=23861
- water, in u.s. stationary field 3=18793
- in CClF₃, u.s., neutron induced 3=14122

Cavity resonators

See Electromagnetic oscillations; Resonators, acoustic.

Celestial mechanics

- acceleration, additional, due to curvilinear motion of centre of gravity 3=23657
- analogy between artificial earth satellites and other celestial bodies, and gyroscopes 3=16320
- asteriod, attracted by sun and heavy planet 3=11496
- asteroids, Kirkwood gaps, theory. 3=13867
- binaries, visual, orbit calc. 3=16409
- comet orbits, polygon approx. falsity 3=18586
- disturbance, lifetime for remaining small, calc. 3=23656
- double stars, orbit calculations 3=13851
- earth-moon problem, plane restricted, periodic librations 3=7021
- Hamiltonian and other systems, asymptotic theory with nearly periodic solutions 3=11669
- Kepler's third law, without calculus 3=13850
- libration points, circular orbits 3=3526
- long-range effects, use of Halphen's method 3=16321
- motion of a star in Galaxy 3=11554
- motion of two bodies of decreasing mass 3=13852
- orbit variations, asteroid Hilda (153) 3=16361
- perihellion motion in electromagnetic gravitation theory 3=23737
- perturbation-of-elements method for comets 3=3527
- planets, layered oblate, free modes 3=11495
- planet and satellite rot.-trans. perturbations due to flattening 3=3525
- planetary eqns. with vectorial elements 3=21083
- planetary, general perturbations, in rectangular coordinates 3=23669
- radial velocity and proper motion, perspective secular changes 3=18587
- satellites, artificial, 24 hour, perturbed motion due to ellipticity 3=18665
- series, convergence, coordinates of unperturbed motion 3=23658
- sidereal period dilatation at great eccentricity 3=21221
- stability of motion about two immovable centres 3=21084
- stellar motion in galaxies, eqns., third integral 3=18647
- synchronous orbits of sphere, ellipsoid, in orbital plane, stability 3=11494
- third integral of motion 3=11492
- three-body problem, Birkhoff-Merman method, extensions 3=18768
- three-body problem, coplanar, canonical reduction 3=5231
- three-body problem, librations near triangular point 3=11743
- three-body problem, with capture 3=1503
- three-body problem, zero velocity curves and orbits 3=11742
- two-body problem, parameter variation method applic. 3=3729
- two fixed centres, generalized problem 3=16437
- two fixed force-centres, matched-conic approx. 3=11493
- two stars in galaxy, appl. of third integral 3=1504

Centrifuges

- centrifugal analyser for 0.1-5 μ 3=8981
- particle size classifier for 4-30 μ 3=8980
- polydisperse systems, ultracentrifuge centre-piece 3=3420
- ultracentrifuge, flotation equil. 3=6932
- ultracentrifuge, mag. supported, for mol. wt. meas. 3=8942
- ultracentrifuge, zonal, for particle separation 3=7077

Ceramics

- conference, Pennsylvania (1962) 3=8917
- crystalline, fracture mechanisms 3=23356
- dielectric materials, development, review 3=20370
- ferrite, with high saturation magnetization and narrow resonance absorption 3=8687
- ferroelectric, applications 3=13110
- ferroelectric, with positive temp. coeff. of resistance, const.-current characteristics 3=25395
- fracture, insulators, electrical, thermal shock resistance 3=17875
- glass as dielectric standard for microwave frequency 3=13103
- polycrystalline, mech. props. rel. to micro-structure 3=23357

Ceramics — contd

- porcelain, permittivity, variation with temp. 3=2953
- reflectivity, rel. to irradiation 3=8585
- teatite, permittivity, variation with temp. 3=2953
- thermal expansion, fracture, insulators, electrical, shock resistance 3=17675
- thermal resistance of pressed powders 3=25217
- Ba_{0.77}Sr_{0.23}TiO₃, rejuvenation effects 3=8561
- BaTiO₃, for fine movement control 3=7418
- BaTiO₃, effect of neutron irradiation, on ferroelec. 3=896
- BaTiO₃, resistance, elec., temp. var., anomalous, intergranular barrier model 3=25399
- (Ba_xSr_{1-x})TiO₃, dielec. and electrocaloric props. 3=2957
- (Na, K)NbO₃ ceramics, spontaneous polarization 3=892
- PbTi_{1-x}Zr_xO₃, p-type elec. conductivity 3=25400
- SrTiO₃, dielec. and electrocaloric props. 3=2957
- Ti, conductivity, electrical, var. during ageing 3=20380
- ZnO-TiO₂-NiO, elec. resist., temp. coeff. 3=13117

Cerium

- diffusion, anomalous, in Ag and Pb 3=13005
- diffusion and microdistrib. in Fe 3=20229
- elec. resistance, 10³-300°K up to 10 000 kg cm⁻³ 3=6558
- f electron, virtual bound state model 3=2756
- phase diagram, 20-350°C, up to 80 x 10³ kg/cm³ 3=16014
- spectra of ions in alkaline earth fluorides 3=25452

Cerium compounds

- Ce aluminates, high permittivity 3=6617
- CeAl₃, mag. moment and Curie pt. 3=991
- CeB₆, optical constants and energy spectra 3=20437
- Ce₂, neutron diffract. & paramag. scatt. analyses 3=1328
- Ce₂C₃, neutron diffract. & paramag. scatt. analyses 3=1328
- CeCl₃-PrCl₃, mixed crystals, fluorescence 3=15708
- CeCl₃.7H₂O, paramagnetic relaxation, liquid He temps. 3=8718
- Ce₂Co₁₁, crystal structure 3=8844
- Ce double nitrate, intermediate-state reorientation of nuclei 3=25172
- Ce-Eu alloys, electronic structure, mag. props. and lattice structure 3=15757
- CeF₃, growth of highly-perfect single crystals for masers 3=23397
- Ce₂Ge₃, crystal structure 3=8842
- CeI₃, molten, elec. cond. of Ce 3=21404
- Ce : LaAl₃, crystalline Stark splitting 3=20071
- (Ce, La)₂Mg₃(NO₃)₁₃.24H₂O, protons, polariz., 170 times increase in 3700 Oe at 1.6°K 3=20065
- CeMg nitrate, pseudoquadrupole coupling of Pm isotopes 3=12906
- CeMg nitrate, rotated at 1.3°K, nuc. polarization 3=14432
- Ce₂Mg₃(NO₃)₁₃, crystal field splittings 3=8333
- CeO₂ and SiO₂, evaporated, as optical film, protective, for mirrors 3=11927
- CeO₂ and SiO₂, evaporated, for optical films, anti-reflection 3=11928
- CeO₂, Ca-doped, electrolytic conductivity 3=17870
- CeO₂-CeF₃, optical films, evaporated, refractive index 3=23035
- CeO₂, thermal expansion, X-ray diffr. meas. 3=8370
- CeO, thin films, dielectric constant 3=8555
- Ce_{1-x}S_x, conduction band structure 3=10628

Change of state

See Phase transformations.

Charge

See Electric charge.

Chemical analysis

- See also Spectrochemical analysis.
- by Castaing microprobe, secondary emission 3=7637
- catalytic probes for det. atom conc. in dissociating gas 3=18430
- combined thermogravimetric and differential thermal analysis apparatus 3=11367
- electrophoresis techniques 3=16171
- fluorometer, double-beam 3=21013
- gas, by optico-acoustic effect, negative, chamber 3=11369
- gas determination in metals, review 3=11370
- gas sampling pump, transistor-driven 3=21011
- i.r., water-heavy water mixtures 3=23561

Chemical analysis—contd

- large molecules in solution, separation by capillary and porous flow 3=113
- luminescence microscopy 3=24012
- microanalysis by secondary ionic emission 3=3422
- moisture content, by neutron probe 3=7078
- molecular composn. of vapours by velocity analysis 3=15399
- oximeter, cuvette, blood, transmission, allowing for light scattering 3=13943
- particulate air contaminants, activation analysis 3=9019
- surface, by α -ray backscattering 3=8991
- thermal, comprehensive, apparatus 3=8988
- Zircaloy-2 and 3, second phase 3=5131
- Al, electron-probe microanalysis 3=11366
- Au, zone-refined, activation analysis 3=3345
- Cu, determination in Al 3=11278
- Na cations in atmospheric particles 3=1408
- Te, high-purity, prod. and analysis 3=18684
- U-concentration meas. by fission tracks 3=21020
- W, determination in W-Fe alloy 3=11278

adsorption

See also Chromatography.

- in graphite vacuum cup electrodes 3=13631

electrochemical

- electromagnetophoresis, ink 3=16901

by mass spectrometry

See also Mass spectrometers, applications.

- complex solids, Mattauch type spectrometer 3=21014
- EA method, extension 3=11372
- gas determination in metals, review 3=11370
- hydrogen, all-metal spectrometer 3=13634
- ion source, negative, for analysis of residual gas 3=21012
- review rel. to tracer and activation analyses 3=3423
- solids, review 3=14685

by nuclear reactions

- apparatus for moon surface analysis 3=21096
- as extension of activation analysis 3=3423
- gas determination in metals, review 3=11370
- Cu in ZnS phosphors, neutron activation 3=11371

radioactive

See also Radiochemistry

- fission products not sorbed by humic acids 3=22439
- isotopes in β -active gases, ionization chamber system 3=6187
- spectrometer, automatic single-channel 3=15126
- tracer, review rel. to mass-spectroscopic and activation analyses 3=3423
- Be⁷, from γ spectra, by electronic subtraction. 3=25905
- Be⁹ in ground state 3=22269
- Cs¹³⁴ traces in Na, K salts 3=11368
- Nb, in Ta foil, using Nb⁹³(p,n)Mo^{93m} 3=8992
- Pu in wastes, γ -monitoring 3=21021
- T, propane proportional counting system. 3=25857
- U²³⁸ activation measurements, γ -coincidence techniques, fission prod. backgnd. 3=1397
- Zr⁹⁵-Nb⁹⁵, Ru¹⁰²-Ru¹⁰² pairs, β - γ coincidences 3=5990

X-ray

See also X-ray examination.

- absolute intensity method, for heavy elements 3=8989
- for adjacent elements 3=21018
- Castaing microprobe, electron image formation 3=21015
- electron beam excitation, microanalysis 3=13632
- electron probe microanalysis, atomic no. effects 3=13630
- electron probe microanalysis, use of multichannel analyser 3=23559
- fluorescence analysis, meas. technique 3=13633
- fluorescence spectroscopy, review 3=16185
- light elements, long wavelength microanalysis 3=18467
- micro, pulse height spectral analysis 3=23560
- microanalyser, electron probe with 90 deg. take-off angle 3=4237
- microanalyser, microfocuss source investig. 3=5801
- microanalysis, quantitative, survey. 3=25855-6
- Monte Carlo calc. of X-ray spatial distribns. 3=21019
- powder camera, Debye-Scherrer 3=6943
- quantitative from X-ray microanalysis 3=6942
- radioisotopes use, survey 3=16186
- spectrochemical nondispersive with β -ray source 3=21017
- spectrometer with 2m arm 3=21919
- K X-ray yields from low atomic no. elements 3=23089

Chemical analysis—contd**X-ray—contd**

- NH₃-Ni cyanide complexes, X-ray powder patterns 3=1406
- U, oxidation degree, valency, by M_v emission spectrum last lines 3=23558

Chemical effects of radiations

See also Nuclear reactions, chemical effects; Photochemistry.

- aqueous solns., yield of e and H atoms 3=3410
- cross-linking in polymers, monomer effects 3=22618
- diphenylmethane e.s.r. spectra in light-irrad. diphenyl-diazomethane 3=4775
- films, solid, catalysis 3=6896
- frozen aq. solns. of S cpds., e.s.r. study 3=15392
- gelatine, water solubility, under α -particles 3=5170
- glasses, organic solns., u.v. irradi., e.s.r. 3=5041
- ion-molecule reactions, for positive, in n-hexane, at low temps. 3=6927
- neutrons, 14.6MeV, solns. of liquid N₂ and O₂ 3=8976
- polymethacrylic acid, trapped electrons 3=2684
- propane, radiolysis, rare-gas sensitized 3=3409
- CsCl, decomposition by electron irradi. 3=17809
- KCl, decomposition by electron irradi. 3=17809
- Mg fluorogermanate, photocoloration, by u.v. irradi. 3=25837
- NaBrO₃, thermal decomposition 3=6911
- NaCl, decomposition by electron irradi. 3=17809
- RbCl, decomposition by electron irradi. 3=17809

acoustic waves

- DNA degradation by noncavitating ultrasound 3=20036

ionizing radiations

- aromatics, analysis of e.s.r. spectra 3=15372
- aspects in nuclear energy, encyclopaedia 3=4285
- biphenyls, hydrogen yield on γ -irradiation 3=3411
- n-butane, gas-phase radiolysis 3=23550
- decomposition products, formation, accommodation in crystals 3=8975
- free radicals in sulphur cpds., e.s.r. in polycryst. state 3=3413
- free radicals prod. in benzene and derivatives 3=2670
- hexabromoethane, solid 3=3412
- n-hexane, liquid, rel. to electrical conductivity 3=11804
- n-hexane, solid, cross-link C₁₂ and hexene products. 3=25838
- humid air, condensation due to u.v. irradi. 3=1870
- humid Ar, condensation due to u.v. irradi. 3=1870
- isobutane, gas-phase radiolysis 3=8978
- methane, radiolysis 3=16182
- nuclear decay of CH₃I¹³⁰ and C₂H₅I¹³¹, formation of Xe-hydrocarbon ions 3=16183
- nuclear reactors, fission, use 3=6924
- polymerization, graft, radiation-induced 3=8959
- polymerization, of acrylonitrile and vinyl acetate 3=6925
- propane-d₈, radiolysis 3=18457
- propane, radiolysis, inhibition of Ar-sensitizing by H 3=8977
- radiolysis of aqueous azide soln. containing mercuric salts 3=16181
- Szilard-Chalmers chem. of solid hexabromoethane 3=3412
- vinyl polymers, gel formation 3=17626
- water, radiolysis, in nuclear reactors, fission 3=15265
- CaF₂, decomposition, electron irradi. in micro-scope 3=21004
- PbI₂, photodecomposition, rel. to elec. cond. 3=2921
- SrF₂, decomposition, electron irradi. in micro-scope 3=21004

Chemical reactions

See also Exchanges, chemical; Heat of formation; Heat of reaction; Oxidation; Photochemistry; Polymerization; Reaction kinetics.

- activation energy and number of bonds 3=18440
- alkali atoms with methyl iodide, Monte Carlo calc. 3=5160
- alkali halides and azides, crystallite growth on cleavage planes, rel. to irradiation 3=20254
- alkali permanganates, decomposition, by thermo-gravimetry and i.r. absorpt. 3=16161
- alloys, energies, rel. to impurity electronic structure 3=22757
- amino-acids with riboflavin 3=8954

Chemical reactions—contd

- arc, electric, effect on heating, sample in electrode 3=24257
- aromatic- CCl_4 complex formation 3=25814
- chain reactions, mousetrap model 3=5316
- chemiluminescence, from O and N reactions 3=25819
- cracking, of cumol and paracumol, on Al_2O_3 or zeolites, effect of additives 3=20996
- cyclohexadienyl radicals, formation by reaction of H with solid benzene 3=1388
- di-tertiary butyl peroxide, gas phase HCl-catalysed decomp. 3=5164
- electron and proton transfer reactions, ion-molecule 3=25816
- enzymes action on macromols. 3=23537
- enzymic 3=3382
- epoxide splitting, base catalysis mechanism 3=20997
- esters, decomposition, criticism 3=25822
- ethanol adsorbed on Al_2O_3 surfaces; catalytic action 3=3362
- ethyl iodide, pyrolysis 3=6915
- ethyl radicals with I atoms, recombination and disproportionation 3=8972
- ethyl- d_3 chem. activated radicals, decomposition 3=11347
- ethylene oxide, first addition to phenol, base catalysis mechanism 3=20997
- equilibria at high-temp., rel. to residual gases 3=18437
- gas phase, study by mass spectrometer 3=21441
- graphite, Kish crystals, oxidation effects microscopy 3=16031
- halomethanes and Na, activation energy and number of CH and CF bonds 3=18440
- haemoglobin—gas reactions 3=3383
- inert gases, with N_2 and CO, high-pressure 3=3387
- ion—molecule, mass spectr. study 3=16156
- ion—molecule reactions, H transfer, cross-sections, energy depend. 3=23540
- isomerization and dimerization rel. to centrifugal sedimentation 3=3388-9
- lomonosovite—muranite group minerals, transitions 3=18325
- luminescence, for wind study, night, upper atmosphere. 3=25918
- mass-spectrometer study 3=21902
- methanol adsorbed on Al_2O_3 surfaces; catalytic action 3=3362
- molecular complex form., organic, by electron transfer 3=21003
- monochloroethyl and trichloromethyl radicals, recombination and disproportionation 3=8974
- μ^+ -meson involvement effects 3=15416
- order det. by absorption spectroscopy 3=6908
- between organic mols., fluoresc., in soln. 3=7215
- phenol, first addition of ethylene oxide, base catalysis mechanism 3=20997
- polyvinyl alcohol solutions and Cu^{++} salts, macromolecules or gel formation 3=16163
- positron lifetimes in aqueous solns. 3=8955
- protein—molecule reactions 3=3383
- pyrolysis of cyclopropane and cyclobutane, isotope effects 3=8961
- rate theory, physico-mathematical foundations 3=3382
- riboflavin with amino-acids 3=8954
- semiconductor formation, oxidation and reduction, effect of equilibrium conditions 3=25824
- statistical method for mech. and rate invest. 3=6423
- transition elements, electron transfer in aqueous soln. 3=8943
- unimolecular decomposition of activated ethyl-d radicals 3=16154
- unimolecular decomposition in nonequilibrium systems 3=8965
- AgBr, with Br_2 vapour, study using defect electron cond. 3=6912
- AgCl, with Cl_2 vapour, study using defect electron cond. 3=6912
- Al with MgF_2 , on heating in vacuo, by reflectance charge 3=8601
- $\text{C} + \text{CCl}_4 \rightarrow \text{C}_2^* + \text{Cl}$, energy distribution 3=11346

Chemical reactions—contd

- $\text{C} + \text{CH} \rightarrow \text{C}_2^* + \text{H}$, energy distribution 3=11346
 - C^{11} recoil reactions in C_6 hydrocarbons 3=11359
 - CD_3 , abstraction of primary, secondary and tertiary H atoms 3=3384
 - CO—O atom 3=5159
 - CdSe prep. by reaction of components 3=25823
 - Cu, oxidation and reduction up to 600°C , rel. to elec. cond. and chemoemission 3=2012
 - Cu, oxidation, surface, dislocations, effect 3=16130
 - Cu^{++} salt and polyvinyl alcohol solutions, macromolecules or gel formation 3=16153
 - F, atomic, gaseous, substitution in CF_4 3=21005
 - Ge and I_2 , etching, mechanism and patterns 3=13601
 - Ge, surface reactions with O and I 3=13555
 - H, atomic, recombination, on Pt surface 3=20987
 - H atoms with 1- C^{13} -propane 3=20989
 - $\text{H} + \text{Cl} \rightarrow \text{HCl} + \text{Cl}$, energy distribution model 3=13593
 - $\text{H}_2 + \text{GeCl}_4$, rel. to Ge layer formation 3=18283
 - $\text{H}_2 + \text{He}$, ion—molecule reactions 3=11342
 - H_2^+ , isotopic, with isotopic H_2 , meas. 3=2677
 - I_2 and Ge, etching, mechanism and patterns 3=13601
 - I_2 , gaseous, in liquid Na 3=21007
 - K with HBr, in crossed molecular beams 3=6914
 - KI, decomposition by u.s. waves 3=16162
 - MgF_2 with Al, on heating in vacuo, by reflectance charge 3=9601
 - N_2 (active)—methylene chloride, quenching by CH_2Cl_2 3=11344
 - N-H radicals 3=8308
 - $\text{NH}_4 + \text{NH}_3 = \text{NH}_3 + \text{NH}_3^+$ correlation time n.m.r. study 3=13589
 - NH_4NO_3 , decomposition, thermal, isotopic tracer study 3=20988
 - NaBrO_3 , thermal decomposition 3=6910-11
 - NaCl single crystals, ductility, effect of atmospheric reaction 3=13355
 - NaN_3 crystals, thermal decomposition 3=13599
 - Ni phosphates, substituted thermogravimetry and thermal analysis, differential 3=15686
 - NiS formation on Ni surface, diffusion process 3=1387
 - NO^+ formation, in ion—molecule reactions 3=23539
 - NO_2 prodn. in liquid N_2 and O_2 by 14.6 MeV neutrons 3=8976
 - O atom recombination by Ar catalysts 3=13595
 - O atom recombination in inert gases 3=13597
 - O atoms with isobutane 3=11340
 - O_2 dil. soln. in liquid N_2 , photolysis in u.v. 3=3408
 - O_2 , from $\text{O} + \text{NO}_2$, spectrum, kinetic, vibr. distrib. 3=25818
 - O—N atomic mixtures, chemi-ionization processes 3=25820
 - $\text{O} + \text{NO}_2 = \text{NO} + \text{O}_2$, via NO_3 , isotope exchange 3=18436
 - PbBr_2 , activity coeffs., in reciprocal molten salt systems $\text{PbBr}_2 + \text{NaCl}$ and $\text{PbCl}_2 + \text{NaBr}$ 3=16155
 - S^{2-} with PO_4^{3-} , B_2O_3 , TiO_2 , MoO_3 , WO_3 , in molten NaF and NaCl, by cryometry 3=8967
 - SnCl_4 , flames, spectra, fluted bands 3=20990
 - W surface, effect of BaO beam 3=23541
 - ZnS formation from vapour, chem. transport 3=25673
 - ZnS-HCl system, vapour transport of solid 3=8945
- Chemical structure**
- See also Bonds
 - n-amyamine, H-bonding dimerization 3=2638
 - charge-transfer complexes, rel. to electronic props. 3=15364
 - gas hydrates 3=17618
 - macromolecules, in solution, and specific vol., apparent 3=14154
 - molecules, deriv. from e.s.r. meas. 3=17611
 - polymers, in solution, and specific vol., apparent 3=14154
 - polypropylene, methyl group rotation, rel. to n.m.r. 3=3200
 - semiconducting polymers 3=10837
 - 3d group central ions, optical electromag. 3=8222
 - uranium oxide hydrates 3=3203
 - Pt—Fe alloys, rel. to mag. structure 3=8696
- Chemical technology**
- extraction, by diffusion, from capillary channels 3=6906
 - fluidized beds, stratification, equilib. 3=9418
 - isotope separation columns, optimization 3=22512
 - pH titration apparatus, automatic 3=8941
 - He, prod. from air decomposition plant 3=16472

Chemical technology—contd

- He, prod. and use 3=16471
 Ne, prod. and use 3=16471
 Ne, prod. from air decomposition plant 3=16472

Cherenkov radiation

- See also Counters, Cherenkov; Electrons, radiation.
 appl. fundamental particle study, high-energy 3=10080
 charge moving in waveguide partially filled with dielec. 3=7683
 charge moving through magnetoplasma 3=24270
 charged particle moving in cyl. stratified media 3=16241
 from cosmic-ray showers, lateral distrib. 3=6119
 in crystals, biaxial, spectral density variations 3=3895
 detector, low noise system 3=24179
 dielectric, spectral density and suppl. waves 3=17240
 electrons in gases, for refr. index meas. 3=14214
 electrons moving in dielec. tube 3=24440
 from e.m. wave front or cluster 3=5981
 energy loss of charged particle 3=2238
 in ferroelectric, transparent, calc. method 3=17241
 mesons in gas, photography of rings produced 3=10081
 neutron and electron scatt. in condensed media 3=7828
 nuclear reactor impulse power meas. 3=12732
 particle in plasma 3=5681
 photography, by transmission secondary emission intensifiers 3=17153
 plasma phase oscill., Cherenkov-like 3=16962
 plasma, quantum electrodynamics 3=12436
 point charge in semi-inf. waveguide filled with dielec. 3=22102
 radiative corrections 3=14929
 review 3=17239
 rings, from cosmic ray μ 's 3=17108
 rings, from π 's, image intensifier 3=17109
 theory, review 3=14951
 Vavilov—Cherenkov, in isotropic optically active medium, theory 3=19607
 Vavilov—Cherenkov, review 3=24685
 water and benzene, γ -irradiated 3=2239

Chlorine

- adsorbed layers on W, kinetics 3=11323
 atmospheric content. 3=25868
 atom, antishielding of mag. and elec. hyperfine interact. 3=25038
 atoms, recombination rate meas. 3=18905
 atoms, spectral transition probabilities 3=702
 Auger yield in X-ray photoeffect 3=14633
 ions, forbidden transition probabs. calc. 3=25055
 molecule, absorpt. spectrum, 4780-6000 Å 3=19976
 molecules, dissociation, in shock waves 3=25147
 solid, elec. field gradient asymmetry 3=15411
 Cl^{35} , Cl^{37} , nuclear quadrupole coupling constants in BrCl 3=25141
 Cl^{35} in $\text{Ba}(\text{ClO}_4)_2 \cdot \text{H}_2\text{O}$, nuclear quad. resonance 3=12336
 Cl^{35} , in paradichlorobenzene, nuclear quadrupole resonance relaxation time 3=25597
 Cl^{35} , n.m.r., in paramag. FeCl_3 3=5049
 Cl_2 crystals, librational motion 3=745

Chlorine compounds

- ClF_3 , bond length differences, theory 3=10497
 ClF_3 , mols., force constant calc. 3=15344
 ClO_2 groups, characteristic vib. freqs. 3=12838
 ClO_2 , microwave spectrum, centrifugal distortion effects 3=6398

Chromatography

- See also Adsorption; Chemical analysis, adsorption.
 appl. to diffusion in gases, meas., rapid 3=11821
 gas, discharge detector 3=8993
 gas, for gases solubility in liquids 3=3798
 stochastic theory 3=8963

Chromium

- antiferromag. ground state as spin density wave state 3=2772
 antiferromagnetism, neutron diffr. exam. 3=23195
 atoms, Cr I emission from shock tube 3=8182
 band electrons, spiral spin polarization 3=8646-7
 cathode, fluorescence yield by X-ray photoeffect meas. 3=6663
 crystal structure, 700°-1700°C, of rolled Cr 3=5100
 crystalline texture of hard deposits 3=25782

Chromium—contd

- crystals, electron distribution 3=6840
 crystals, K-absorption spectra 3=3030
 damping capacity and relative rigidity modulus rel. to magnetic transition temp. 3=25615
 diffusion in βU 3=10691
 ductility, effect of cold rolling, strain rate 3=3236
 ductility rel. to W 3=10655
 e.s.r. and optical spectra in K_2CrO_8 3=3166
 e.s.r. in CdS of Cr^{3+} , 1.4°K 3=23226
 elastic const. and thermal expansion, anomalies 3=8753
 elastic const. from diffuse X-ray and u.s. techniques 3=23285
 electronic band structure, by de Haas-Van Alphen meas. 3=6492
 electronic sp. ht. and paramag. susceptibility 3=8363
 embrittlement process on recrystallization 3=16005
 Fermi surface area from skin effect meas. 3=2757
 films, Cr, Cr + Ni, vacuum evaporated, on C at 400°C electron diffr. exam. 3=16143
 films, deposition, evaporation rate rel. to background pressure 3=18382
 impurity phases distrib. after recryst. 3=15485
 ion pairs in ruby, e.s.r., exchange interactions 3=3167
 ions, adsorbed by exchange of ions, e.p.r. spectrum 3=8707
 ions, Cr^{3+} , in octahedral crystal fields, spectrum 3=25454
 ions, Cr^{3+} in ruby, radiationless transitions 3=15456
 isotopic foils for nuclear investigations 3=24533
 magnetomechanical effects, 90° to 480°K 3=25604
 metal, 3d electrons config. 3=4833
 paramagnetic reson. and relax., electric fields effects, calc. 3=18126
 paramagnetism, induced orbital 3=20561
 photoelectric emission, by polarized X-rays 3=14630
 in ruby, synthetic, distribution, by X-ray micro-analysis 3=8808
 single crystals, magnetic props. by neutron diffraction 3=1109
 thermoelectric anomaly at 35°C 3=10897
 thermoelectric power, 4.2°-340°K 3=13140
 Cr^{2+} in aq. solns., producing O^{17} n.m.r. shifts 3=9481
 Cr^{2+} , optical absorption 3=23066
 Cr^{3+} , e.p.r. in MgWO_4 3=15939
 Cr^{3+} , e.s.r. in CaO 3=3181
 Cr^{3+} , e.s.r. in Al_2O_3 and MgO , elec. shifts 3=25568
 Cr^{3+} , e.s.r. in ZnS 3=3170
 Cr^{3+} , e.s.r. in ZnWO_4 3=3169
 Cr^{3+} , in corundum, spin-lattice interaction, 4-90°K 3=5037
 Cr^{3+} , in ruby, spin-lattice relax. time, 9kMc/s 3=13298
 Cr^{3+} , line broadening of P^{31} n.m.r. absorpt. in H_3PO_4 3=13316
 Cr^{3+} , e.s.r. on MgTiO_3 at 24 and 35 kMc/s 3=15938
 Cr^{3+} , paramagnetic resonance spectrum at low and room temp. 3=25567
 Cr^{3+} , spin level splitting, Jahn-Teller effect 3=10452
 Cr^{3+} , electron paramagnetic resonance, in glycerol or water 3=7219

Chromium compounds

- chromates, magnetic susceptibilities, 80-360°K 3=5000
 chromia-alumina, adsorption of CO and CO_2 3=3359
 chromite, spinels, phase transformations 3=16018
 chromium luminors, luminescence rel. to structure and deformations 3=20512
 complexes, Cr^{3+} , $^4\text{T}_{2g}$ state, rotational strength 3=8271
 X-ray emission lines, chemical-bond effects 3=23086
 Cr alum, nonresonant paramag. absorption of sound 3=22652
 Cr nitrides, elec., thermoelec. props. 3=865
 Cr spinelides, crystallochemical transformation rel. to calcination 3=16081
 Cr spinels, deformation by spin-orbit and Jahn-Teller effects 3=1010
 Cr^{3+} salt solns. e.s.r. 3=3818
 Cr^{3+} in tetrahedral, octahedral and dodecahedral coordination, spin-lattice relaxation 3=13311
 CrB, crystal structure, rel. to similar types 3=18338
 CrB, n.m.r. and quadrupole binding const. 3=20678
 CrB, paramag. props. (150-800°K) and thermo-electricity 3=1124

Chromium compounds—contd

- CrB₃, quadrupole bond, n.m.r. meas. and calc. 3=11121
 CrBr₃, dislocation ribbons, geometry, surface influence 3=17734
 CrBr₃, domain structure, light-diffraction study 3=11072
 CrBr₃, ferromag. and paramag. res. line widths 3=23204
 CrBr₃, magnetic rotation of visible light 3=919
 CrBr₃, magneto-optical props. and ferromag. resonance 3=15656
 CrBr₃, magnetostatic modes, visual obs. 3=23200
 CrBr₃, principal magnetization below 40°K 3=3140
 CrCl₃, antiferromag. ordering and entropy changes 3=1061
 CrCl₃.4H₂O, Cr³⁺ optical absorption 3=23066
 CrCl₃, antiferromag., sublattice, low-temp. 3=25552
 CrCl₃, ferromag. and paramag. res. line widths 3=23204
 CrCl₃, principal magnetization below 40°K 3=3140
 Cr(CN)₆NO³⁻ ion, e.s.r., Cr³⁺, C¹³ h.f.s. and lines 3=20014-15
 Cr(CO)₆, bond length shortening, theory 3=10497
 Cr-Fe alloy, X-ray diffraction, line intensities, temp. depend. 3=20864
 Cr-Fe alloys, average ferromagnetic moment 3=11055
 (CrFe)B, Curie points and magnetic moments 3=8637
 Cr-Ir, superconductivity and ferromagnetism 3=1900
 Cr-Mn(15%), antiferromagnetism, from neutron diffr. 3=18110
 Cr-Mn(15%), neutron diffr., superlattice peak and antiferromag. 3=18110
 Cr-Mn, paramag. susceptibility, rel. to temp. 3=999
 Cr-N, dilute, precipitation and elec. cond. 3=6865
 Cr-Nb-Ni, polymorphous transformations 3=5119
 [Cr(NH₃)₆]Cl₃ crystals diluted with [Co(NH₃)₆]Cl₃, paramag. res. 3=1182
 Cr-Ni, equil. diagram 3=11289
 Cr-Ni-Al alloys, Cr vapour pressure, 1060°-1300°C 3=1872
 CrO, crystal structure, atomic, from powder pattern 3=23369
 CrO₂, Cr³⁺ n.m.r., below 240°K 3=18149
 CrO₂, cryst. anisotropy energy calc. 3=15413
 CrO₂, Curie temperature meas. 3=17022
 CrO₂, with var. V oxide, Curie temp., saturation moment 3=11054
 Cr₂O₃, absorption spectrum, exchange splitting of Cr³⁺ lines 3=15672
 (Cr₂O₃)_{1-x}(Al₂O₃)_x, antiferromag. resonance, high-field. 3=1158
 (Cr₂O₃)_{0.8}(Al₂O₃)_{0.2}, magnetization induced by elec. field 3=15740
 Cr₂O₃, antiferromag., magnetoelec. effects 3=834
 Cr₂O₃, antiferromagnetic reson., high-field meas. 3=11107
 Cr₂O₃, conductivity, rel. to nuclear radiation 3=2909
 Cr₂O₃, crystal field and optical spectra, comparison with ruby 3=15675
 Cr₂O₃, dielec. consts. at 1 kc/s and 2 Mc/s 3=8548
 Cr₂O₃-Fe₂O₃, mag. structure, neutron diffr. meas. 3=13267
 Cr₂O₃, fine grains, antiferromagnetic resonance 3=23218
 Cr₂O₃, elasticity, temp., var., anomalies 3=6774
 Cr₂O₃ fine grains, mag. susceptibility rel. to diam., 20 to 400 Å 3=1094
 Cr₂O₃ fine grains, superantiferromag. and superparamag. props. 3=1093
 Cr₂O₃, fine particles, antiferromagnetic properties 3=8697
 Cr₂O₃ grains, anisotropy energies 3=15905
 Cr₂O₃, magnetization induced by elec. field (magnetoelectric effect) 3=15739
 Cr₂O₃, magnetization induced by elec. field 3=15740
 Cr₂O₃, mag. and optical props., ion pair model 3=25503
 Cr₂O₃, magnetoelectric, effects, spin-orbit mechanism 3=4900
 Cr₂O₃, on Al₂O₃, e.s.r. 3=13297
 Cr₂O₃, paramagnetic reson. absorpt., 15 times reduction by heating at 1000°C 3=20643
 Cr₂O₃, particles 20-400 Å diam., mag. props. 3=3137
 Cr₂O₃ powder, magnetoelec. effect 3=13027
 Cr₂O₃, Zeeman effect of R absorption lines 3=15674
 CrPt, mag. spin distribution 3=15880

Chromium compounds—contd

- CrPt, mag. spin distribution 3=15880
 Cr-Rh, superconductivity and ferromagnetism 3=1900
 Cr-Ru, superconductivity 3=1900
 CrS_{1.7}, ferrimagnetism, origin, by quenching and pressure squeezing 3=1024
 CrSO₄.7H₂O, Cr³⁺ optical absorption 3=23066
 CrSb-MnSb system, magnetic structure 3=8698
 CrSi₂, thermoelec. and elec. props. 3=25427
 CrTe, structures of several phases 3=18095
 CrTex, crystallography and electrical properties 3=23464
 Cr-Ti system, b.c.c., Kirkendall effect 3=4887
 CrVO₄, high-pressure form, atomic structure, from X-ray diffr. 3=11270
- Cinematography**
 See also Cameras.
 microscopic objects, with simultaneous measurement recording 3=1845
 spectral cinematographical methods, development 3=7327
- Circuits**
 See also Counting circuits.
 a.c. bridge balance indicator, phase selective 3=9695
 a.g.c. amplifier to correct for light source variations in spectrofluorometers 3=5605
 accelerating voltage stabilizer for cyclotron 3=14694
 analogue-to-digital amplitude-to-time converter, transistorized 3=19148
 appearance potl. recorder 3=2056
 artificial ear, acoustic coupling rel. to elec. impedance of receivers 3=3653
 automatic plotting, second deriv. of Langmuir probe curves 3=12185
 bridge, a.c., with indication of unbalance direction 3=7412
 bridge, for capacit. of double layer on Hg dropping electrode 3=14476
 bridge, substitution, for r.f. permittivity meas. 3=14477
 bridge thermocouple circuit for piezoelec.-crystal current meas. 3=3974
 bubble chamber operation 3=3975
 Castaing microprobe, electron image formation 3=21015
 capacitance-conductance bridge, dielec. meas. 3=21682
 capacitative accumulator, linearity 3=1919
 capacitor banks, low inductance, transient phenomena 3=12046
 cosmic rays automatic data recording, transistorized 3=15057
 current stabilizer with positive feedback in regulator amplifier 3=21693
 current stabilizer for X-ray tubes 3=9701
 curve plotting with pulse-height analyser 3=9392
 d.c. supply, 30A 4kW, using Si components 3=7413
 dee voltage stabilizer for cyclotron 3=2058
 deflector voltage stabilizer for cyclotron 3=14695
 detection system, low-level low-freq. 3=3980
 digital data processing, nuclear physics 3=5325
 digital display for thermistor thermometer 3=24090
 discharge, 280 V, characteristics rel. to spectral line intensities 3=24230
 electric current-vacuum analogy 3=21452
 electrometer, negative feedback 3=5604
 electron microscope power supply; resolution 5A 3=1911
 electron tube g₁-g₂ charact. display, 6BN6 3=21684
 electron, tube, Klystron, protection, filament voltage 3=24172
 electronic variable delay to trace characteristic curves of counting circuits 3=24175
 Enetra 110, track-visualization apparatus 3=4305-6
 equivalent circuits, for elec. and mag. props. of rocks 3=19135
 exploding wire, current meas. and transient skin effects 3=3981
 filament lamps, hum cancellation 3=24177
 flash tubes during repeated discharges 3=1921
 frequency-dividing networks for sound reproduction 3=23981
 frequency doubling, pentode with two control grids 3=21683
 frequency doubling, transistorized, up to 0.5 Mc/s 3=24169
 frequency multiplier, phase variations 3=24170
 frequency standards installation for microwave spectroscopy 3=19465

Circuits—contd

- gas sampling pump, transistor-driven 3=21011
 gate, fast linear, for shaping scintillator pulses for height analysers 3=19151
 harmonic generator, parametric, phase relns. 3=1912
 high voltage pulse meas. system 3=12044
 high-voltage stabilizer 3=24165
 ignitrons, switching, rel. to toroidal pinch 3=4143
 impedance converter for digital voltmeters 3=9702
 inductance potentiometer, piezo-susceptibility meas. 3=12288
 induction pick-up for magnetotelluric invest. 3=9122
 integrator, digital, for small currents, pulsed and d.c. 3=19138
 integrator, long-period, using Miller effect 3=5609
 interferometer, microwave, polar, for plasma electron density meas. 3=4148
 interferometer, ultrasonic, for elastic const. high-pressure dep. meas. 3=223
 ionization-gauge filaments, protection 3=5472
 for Langmuir probe data, rapid reduction 3=5678
 of linear accelerator, 2 MeV, pulsed 3=16995
 liquid-level indicator for opaque cryostats 3=24127
 luminescence, decay time meas., 10^{-2} – 10^{-5} sec 3=14478
 mag. field stabilization, beam deflection system 3=456
 magnetic, alternating, complex quantities 3=9909
 magnetic probe, multi-coil 3=16954
 magneto-optical double resonance meas. 3=5533
 mass spectrometer, industrial 3=12260
 mass spectrometer, ion source, power supply 3=12261
 mass spectrometer, two-stage, for nuclear work 3=16993
 mass spectrometers, scanning 3=14484
 measuring resistors, phase error or a.c. correction 3=350
 microcalorimeter, E.Calvert type 3=3916
 modulation cct. for photomultiplier output 3=3979
 negative resistance and relaxation oscillators 3=9697
 neuron network, circuit theory 3=7061
 neutron diffractometer automatic programming-control system 3=1280
 nonlinear systems, harmonic response 3=19133
 nonlinear systems, thermal fluctuations 3=11705
 nuclear instrument conference 3=12364
 nuc. mag. resonance twin-T bridge 3=517
 ohmmeter, linear, 10^{-2} – $2 \times 10^8 \Omega$ 3=16884
 1 kW precision current supply 3=19136
 oscillator, frequency stability 3=14486
 oscillator phase-lock system, GR 1209-B 3=14485
 oscillograph time-base calibration 3=24171
 oscillograph, ultrahigh-speed pulse 3=1914
 particle accelerator instrumentation 3=24178
 photoluminescence, automatic adjustment of excitation voltage 3=1806
 photometer, CdS, for electron emission, field 3=18960
 photomultiplier gain stabilization circuit 3=24174
 phototransistor galvanometer relay 3=348
 physiological "cold" stimulator 3=9699
 plasma probe, Langmuir chars., display 3=14600
 power supply for expander for betatron 3=14480
 power supply, 500–10 000 V, mass spectrometer 3=24166
 power supply for student lab. 3=346
 power supply, magnets, Si controlled rectifier, stabilized 3=19137
 pulse amplifier for nuclear spectroscopy 3=12047
 pulse circuit for synchrocyclotron oscillator 3=2059
 pulse generator for semiconductor lifetime measurements 3=12050
 pulse, picosecond, characts., by self-sampling 3=5612
 pulse taumeter, modulated light source 3=1808
 RC lines, non-uniform, steady-state sine-wave solutions 3=14487
 r.f. bridge for pulsed n.m.r. expts. 3=9961
 for radiation monitors with sound indication of intensity 3=2169
 for radio telemetering temp. 3=7374
 radiometric apparatus, vacuum tube-transistor stages 3=24176
 real passive networks, amplitudes, phases 3=5602

Circuits—contd

- ruby laser, output fluctuation control by feedback system 3=5890
 semiconducting tunnel diode scale-of-four 3=17917
 semiconducting tunnel diode univibrator, improving 3=14488
 shock tube, 8×2 in. 3=1763
 shot peening, microcapacity measuring circuit 3=3976
 simulator for ear basilar membrane freq. discrimination 3=21155
 solid-state, conference, Philadelphia (1963) 3=14465
 space vehicles, instrumentation, automatic range switching 3=13940
 spark gap, controlled double-trigger 3=1920
 switching, 250Mc/s 3=14490
 switch, 100 kV, for high-energy capacitor discharge 3=349
 switching-time recording 3=16889
 temp. rise, linear or hyperbolic, electronic controller 3=14407
 thermocouple potentiometer 3=14475
 thermodynamics, Onsager-Casimir relns. 3=12039
 thermoelectrically maintained standard temperature, ice point 3=19050
 thermometer, resistance, Pt, deep sea, short time const. 3=19053
 time-amplitude converter, sub-nsec meas. 3=19149
 time analysers, multichannel, nsec range 3=16574
 time resolved spectroscopy, precision system 3=1813
 timed, universal programmed 3=8700
 transistorized logarithmic time base 3=24173
 transistorized stabilized power supply 0-2000V 3=14481
 transistorized time standard 3=1654
 tunnel diode, pulse-shaping 3=19139
 turnstile junction 3=347
 25 kV target modulator sweep circuit 3=12265
 vacuum gauge, thermocouple 3=5473
 vacuum pumps, ion getter 3=5471
 voltage meas., strong fields present 3=21672
 voltage stabilizer for Cockcroft-Walton machine 3=9882
 voltage stabilizer, 50 kV d.c. 3=14479
 voltage stabilizer for photometry 3=9698
 voltage stabilizer for photometry 3=16888
 wide-band electronic integrator 3=24168
 X-ray emission spectra, shape correction 3=5601
 Zener diodes as voltage-controlled capacitors 3=25380

Clay

- ion exchange on 3=11364
 kaolinite hydrous micro-quartz clay, moisture expn., surface area 3=6878
 plasticity, meas., two new instruments 3=13360
 water between layers, n.m.r., rel. to temp. 3=23261

Climatology

See Meteorology; Weather.

Cloud chambers

- Aitken, droplet growth under extreme cooling 3=302
 diffusion, controlled by photoelec. multiplier 3=2171
 diffusion, neutron polarization meas. 3=19654
 electron avalanche growth, study of 3=21711
 He, low pressure, flash photography triggering 3=2172
 ice nucleation study 3=1273
 ionization type, with alcohol vapour diffusion in argon 3=7745
 nuclei, hypersensitive stable charged droplet 3=3933
 optical meas. on aerosols, design 3=9584
 stopping power, atomic, gas-vapour mixture, with temp. gradient 3=22046

Clouds

- artificial seeding, PbI_2 aerosols 3=8987
 and atmospheric electricity, pot. gradient, lower troposphere 3=18513
 brightness, spatial distrib. 3=18509
 buoyancy increase, atmospheric thermals 3=11402
 cirrus, emissivity meas. 3=18548
 cirrus, i.r. reflection props. 3=18219
 cirrus, and increase in electrical pot. gradient and cond 200-300 mb level 3=18512
 cirrus, in jet streams 3=21035
 cirrus, snow crystals 3=18504
 convection, salt-induced, 3=18218

Clouds — contd

- cumuli, small, convective patterns. 3=25876
- cumuliform, evolution of droplet spectrum, theory 3=3464
- cumulonimbus clouds, small, glaciation 3=9038
- cumulo-nimbus updraughts, entraining jet model 3=6960
- cumulus congestus, precip. particle meas. 3=9037
- cumulus, development, axially symm. 3=3463
- cumulus, initial electrification, rel. to space charge 3=9039
- cumulus, initial electrification, rel. to atmos. space charge. 3=25884
- cumulus, precipitation model rel. to drops size meas. 3=5201
- cumulus, updraft, eddy structure growing droplets and depth of first radar echo 3=13668
- droplets, collision efficiency in electric fields 3=13677
- formation by controlled convection. 3=25886
- formation, pptn., review 3=1439
- granularity meas. by light scatt. 3=21009
- hailstones, influences on growth 3=1443
- ice cloud formation at mesopause 3=1440
- ice-nucleating activity of materials 3=1273
- indirect probing techniques using radar 3=5188
- light beam attenuation, effect of diffusion 3=3467
- lightning atmospherics 3=9049
- longitudinal rolls, theory 3=9412
- macrophysics, structures, elec. and other props. 3=18505
- mother-of-pearl, two-dimensional model 3=1441
- noctilucant, Alaska 3=9095
- nomenclature, relation to mechanisms 3=21039
- rain, artificial, prod. in 3=13676
- stratiform, light scatt. 3=9043
- stratosphere, new type, Northern Arizona 3=16220
- stratus cloud, vertical structure 3=1442
- thunderclouds, ice crystals, elec. charge prod. 3=11401
- tracking by television, in satellites, non-Russian, review 3=18492
- vertical air velocity and buoyancy, aircraft meas. 3=1438
- vortex patterns, advection in formation 3=6959
- water, supercooled, crystallization, use of Ag I 3=11398
- wind velos., up and down, Cb cells, by radiosonde balloon 3=13673

Coal

- graphitized, γ -ray absorption rel. to applied pressure 3=20703
- mines, hammer blow signals, range 3=14284
- pore structure of briquettes, rel. to compacting pressure 3=13550

Cobalt

- chemisorption of H 3=5163
- creep, energy barrier control in β -phase 3=11162
- crystals, c-plane, domain structure, magnetostatic energy 3=11073
- crystals, mag. anisotropy of hexagonal phase 3=1141
- crystal structure, α - and β -phases, interrelationship 3=1257
- deformation twins, by tensile loading, -196°C 3=8800
- diffusion in pure Au, meas. 3=8449
- diffusion in Ag 3=22814
- diffusion in Ag, rel. to solubility 3=13006
- diffusion of W, by electric current, 1100-1350°C 3=17782
- dislocation density, flow stress and stored energy 3=11159
- domain structure 3=1063
- domain structure in epitaxial films 3=15830
- electrolytic deposition for targets and radioactive sources 3=24532
- f.c.c., magnetocrystalline anisotropy, 4°-2° to 850°K 3=1038
- Fe⁶⁷, dissolved, n.m.r. 3=23258
- ferromagnetic anisotropy, second const. 3=13246
- ferromagnetic resonance 3=23203
- films, absorption, light, oxidation and wavelength effects 3=17991
- films, domain structure and imperfections 3=8676
- films, electrical conductivity and perp. Hall effect 3=17822
- films, electrical and thermoelectric properties 3=15539
- films, electron mirror micrographs, stray field meas. 3=13266
- films, magnetic domains 3=18086
- films, optical consts. rel. to wavelength 3=10902

Cobalt — contd

- films, orientated overgrowth 3=18379
 - films, spin pinning at surface 3=15839
 - films, strip domain structure 3=20587
 - films, structr., by electron diffraction 3=1369
 - films, 1000 Å, ferromagnetic domain obs. 3=20605
 - Hall effect and magnetoresistance, anomalous, localized d- electron model 3=827
 - Hall effect anisotropy, crystal symmetry 3=841
 - ions, Co II, crystal-field spectra in various cpds. 3=25453
 - liquid, viscosity 3=14115
 - magnetic anisotropy, induced, rel. to temp. 3=1039
 - magnetic domain structure 3=15799
 - magnetic domain structure, surface 3=23164
 - magnetic internal field, Au¹⁹⁷ Mössbauer data 3=6458
 - magnetic, initial susceptibility, coercive force, temp. and deform. depend. 3=20576
 - magnetic susceptibility at γ /d and melting point 3=8654
 - magnetization distribution, domain boundary layers 3=25530
 - magneto-optical effects rel. to optical consts. 3=10918
 - magneto-optical and optical props., i.r. 3=10919
 - n.m.r. 3=23259
 - n.m.r. of Co⁵⁹, 25°-600°C meas. 3=18150
 - n.m.r., due to nuclei in Bloch walls 3=3193
 - n.m.r., longitudinal, model and expt. 3=3197
 - n.m.r. rel. to ferromag. props. 3=1200
 - neutron form factors; spin density distrib., Hartree-Fock calc. 3=1103
 - plastic deformation, anisotropy meas. 3=11160
 - plastic deformation, slip line patterns 3=18187
 - powder, deformed, elastic anisotropy and lattice strain 3=1231
 - stress relax. after plastic deformation 3=18172
 - thin sections, phase transformations, h.c.p. to f.c.c. 3=1351
 - whiskers, orientation and oxidation 3=23412
 - whiskers, tensile rupture tests 3=6801
 - Co II, relative oscillator strengths 3=8181
 - Co²⁺, e.s.r. in CaO 3=3181
 - Co²⁺, line broadening of P³¹ n.m.r. absorpt. in H₃PO₄ 3=13316
 - Co²⁺ in organic solvents, NaCl and KCl, optical props. 3=10923
 - Co⁵⁹, n.m.r. in hexagonal and cubic Co. 3=1199
 - Co⁵⁹ nuclear mag. resonance in f.c.c. Co metal 3=1198
- Cobalt compounds**
- complexes, Co²⁺, ¹T_{1g} state, rotational strength 3=8271
 - sphero-cobaltite crystallization in CoCO₃.Co(OH)₂: RCl-H₂O-CO₂ 3=18267
 - Vicalloy, ferromag. anisotropy 3=18074
 - Vicalloy, precipitation-hardened, microstructure 3=20895
 - Vicalloy II, magnetic hardness, X-ray meas. 3=18095
 - Vikalloy, crystal and mag. structure 3=5113
 - Co alloys, impure, d-band structure 3=10622
 - Co-Al alloys, oxidation, around Curie point 3=11337
 - CoAl, electron distrib., X-ray meas. 3=18092
 - CoAl, ordering rel. to composition 3=16104
 - CoAlO₂, ion and electron conductivities 3=15589
 - Co(AlCl₄)₂, crystal structure 3=1330
 - CoAsS, cond. elec., temp. var., paramagnetism 3=6601
 - CoB, paramag. props. (150-800°K) 3=1124
 - CoBr, spectra, λ 4300 - λ 4700 Å 3=12818
 - CoBr₂, crystal-field spectra of d³, d⁷ ions 3=25453
 - Co binary solid solutions, with Al, Ga, Si, Ge, Sn 3=16121
 - Co₃C, cryst. structr., by electron diffraction 3=1324
 - CoCO₃, hexagonal anisotropy and magnetization curves 3=18112
 - CoCO₃, magnetic anisotropy 3=3098
 - CoCO₃, specific heat, 1.6° to 70°K, rel. to antiferromag. transition 3=17659
 - Co-CW, abrasion, surface fracture mech. 3=5075
 - CoCl₄²⁻, absorption spectrum in crystalline environment 3=20472
 - CoCl₂, antiferromagnetic ordering 3=20625
 - CoCl₂, antiferromagnetic properties 3=20626
 - CoCl₂, antiferromag. relaxation 3=5034
 - CoCl₂, crystal-field spectra of d³, d⁷ ions 3=25453
 - CoCl₂.2H₂O, proton structure 3=20853

Cobalt compounds — contd

- CoCl₂·6H₂O, antiferromag. res. & anisotropic exchange interactions, liq. He temp. 3=1176
- CoCl₂·6H₂O, proton mag. res. 3=1207
- CoCl₂·6H₂O; water mol. orientations by n.m.r. 3=1201
- CoCl₂, spin waves, semicontinuum model 3=13286
- Co(III) complexes, spin-forbidden absorpt. band 3=22557
- CoCr₂O₄, ion and electron conductivities 3=15589
- CoCs₂Cl₃, Zeeman effect, 2.0-1.6°K, 15-40 kG 3=13166
- Co-Cu, dilute alloys, ferromag. and antiferromag. terms 3=5028
- CoF₃, antiferromagnetic resonance in far. i.r. 3=15930
- CoF₂, i.r. absorption, effect of antiferromag. ordering 3=15673
- CoF₂ - ZnF₂, Néel temp. by n.m.r. 3=1055
- Co_{0.92}Fe_{0.08}, magnetic-nuclear neutron scattering amplitude 3=18099
- Co-Fe, ordering, recrystallization meas. 3=11296
- CoFe₂O₄ (ferrite), magnetic domain structure 3=11098
- CoFe₂O₄, films, Faraday rotation and mag. hysteresis 3=15655
- Co ferrite crystals growth, ferrous free 3=11230
- Co ferrite, internal mag. field at Co nuclei 3=1154
- Co halide complexes, tetrahedral, spectra 3=15354
- Co²⁺ hydrated salts, paramag. behaviour 3=6691
- Co(H₂O)₆·SiF₆, adiabatic demagnetization 3=1059
- CoHg(SeCN)₄, lattice parameters and thermal expansion coeffs. 3=18083
- CoMn ferrite, ferrimag. resonance anomalies 3=15924
- CoMoO₄, crystal structure 3=5110
- Co-Ni alloys, diffusion of Co and Ni, mag. effects, near Curie temp. 3=15514
- Co-Ni alloys, induced magnetic anisotropy, rel. to temp. 3=1039
- Co-Ni alloys, phase transformations h.c.p. to f.c.c. 3=1351
- Co-Ni, mag. moments and degree of order 3=25539
- Co-Ni-P alloys, fine-particle structure and mag. props. of electrodeposits 3=16097
- Co-Ni-P alloys, hard magnetic films 3=15835
- Co-Ni, dilute, Ni⁶¹ n.m.r. 3=3199
- CoNi magnetic moment distrib. 3=1110
- CoNi, magnetic moment distrib. 3=1110
- Co-Ni-Nb alloys, mechanical props. 3=20724
- CoO, antiferromagnetic magnetostriction 3=1016
- CoO, elasticity, temp. var. anomalies 3=6774
- (CoO)_{0.95}(MnO)_{0.05}(MgO)_{0.875}Fe₂O₃, subsidiary resonance, rel. to crit. microwave fld. strength 3=18121
- Co orthosilicates, mag. props. 77°-300°K 3=23142
- Co-P alloys, fine-particle structure and mag. props. of electrodeposits 3=16097
- Co-P electrodeposits, mag. props. 3=11052
- CoPd magnetic moment distrib. 3=1110
- CoPd, magnetic moment distrib. 3=1110
- Co-Pd oxidation, reactivity anomaly at Co Curie point 3=20982
- Co pentamminebromo complexes, Br^{80m} decay effects 3=23553
- Co(II) pyridine complexes, i.r. spectrum of thiocyanate group 3=22581
- CoRh₂O₄, antiferromagnetism 3=23196
- Co-S phase diagrams and electrical conductivity 3=25734
- Co₂S₃, crystal structure 3=8840
- β-CoSO₄, antiferromagnetic props. 3=15731
- β-CoSO₄, antiferromag. structure 3=8695
- CoSO₄, solutions, aqueous, absorp. of acoustic waves, u.s., and dissociation 3=14160
- CoSO₄·H₂O, crystal structure 3=18327
- CoSO₄·6H₂O, crystal structure 3=8851
- CoSO₄·7H₂O, mag. induction in high fields at low temp. 3=6689
- CoSO₄·7H₂O, magnetothermodynamic data, 0-100 kG 3=25504
- CoSO₄·7H₂O, u.s. velocities, elastic const., and structure 3=20690
- Co salts, spin-lattice relaxations of paramag. dispersion 3=23241
- CoSb₂, crystal structure 3=13518
- CoSb₂-type cpds, semiconductivity 3=20329
- CoSi, thermoelec. and elec. props. 3=25427

Cobalt compounds — contd

- Co_{1-x}Sn, mag. moment rel. to sublattice metallic and covalent nature 3=1005
 - Co solid solns, with Fe, Ni, Cu, Mn, Cr, rel. to ferromag. props. 3=1200
 - CoTe, self-diffusion of Co and Te 3=20221
 - Co-Tutton salt, antiferromagnetism 3=1058
 - CoUO₄, magnetic structure 3=3139
 - CoWO₄, crystal-field spectra of d³, d⁷ ions 3=25453
 - Co_{2-x}Zn_xTiO₄, ferrimag. props. 1.6°-400°K 3=1030
- Cold working**
- See also Plastic deformation; Slip; Work-hardening.
 - alkali halides, and X-ray line broadening 3=8934
 - brass, α, deformation faults, density 3=6524
 - f.c.c. = h.c.p. transformations, relation 3=3256
 - metals, rel. particle size and strain broadening separation 3=25754
 - steel, autoradiography of defects 3=5143
 - steel, Fe, cast, effect on particle size and lattice distortions 3=18401
 - Ag filings, X-ray study of damage 3=18202
 - Ag, stored energy release on annealing 3=11173
 - Al, cold drawing, rel. to deformation texture 3=25783
 - Al crystal, point defects and cond., magnetoresist., Hall coeff. temp. var. 3=17816
 - Al, hardness and conductivity, electrical, changes 3=13373
 - Al, hardness relax. rel. to lattice distortions 3=11187
 - Al, mosaic block disorientation 3=10682
 - Al-Cu alloys, quench age hardening 3=6796
 - Al, zone refined, defect elimination, in liquid H 3=16089
 - Au, internal friction peaks, low temp. 3=3212
 - Au, internal friction peaks at low temps. 3=11136
 - Au-Co (1.57 wt.%) and mag. anisotropy 3=20580
 - Co powders, elastic anisotropy and lattice strain 3=1231
 - Cr, ductility, effect of rolling temp. 3=3236
 - Cu, crystal, point defects and cond., magnetoresist., Hall coeff. temp. var. 3=17816
 - Cu, hard drawn fine wires, lattice dilation 3=18212
 - Cu, hardness and conductivity, electrical, changes 3=13373
 - Cu, hardness relax. rel. to lattice distortions 3=11187
 - Cu, internal friction peaks at low temps. 3=11136
 - Cu, rel. to H₂ solubility and diffusion 3=20220
 - Cu, rolled, dislocations, electron microscope exam. 3=15493
 - Cu, strip cold rolled from powder, and resistance, elec. 3=22900
 - Cu, stored energy release on annealing 3=11173
 - Cu, wire, rolling, 78°K, and conductivity, electrical, recovery 3=20266
 - Fe, cast, steel, effect on particle size and lattice distortions 3=18401
 - Fe cellular structure within crystals, by electron microscopy 3=13521
 - Fe, cold-rolled, primary recryst. texture 3=18353
 - Fe, rel. to ductility 3=13349
 - Fe wires, ageing, dislocation atmospheres 3=13333
 - Fe-Pd alloys with low exp. coeffs. 3=2734
 - Fe-3% Si, effect on crystal orientation and mag. props. 3=6704
 - GaSe, effect on elec. cond. and Hall effect 3=2913
 - GaTe, effect on elec. cond. and Hall effect 3=2913
 - In alloys, superconducting transition 3=7403
 - KBr, and X-ray line broadening 3=8934
 - LiF, rel. to lattice parameter changes 3=8838
 - Mg, vacancies, formation and activation energies and mobility 3=25269
 - NaCl, and X-ray line broadening 3=8934
 - NaCl, surface treatment, deform. processes 3=8785
 - NaF, and X-ray line broadening 3=8934
 - Ni, hardness and conductivity, electrical, changes 3=13373
 - Ni, stored energy release on annealing 3=11173
 - Pb, superconductivity, effect of crit. fields 3=5588
 - PbTe, X-ray diffr. study 3=18203
 - Ti-Mo alloy, martensitic phases 3=23477
 - Ti-Mo, supercond., effect of cold-rolling 3=9686
 - U, cold-rolled, annealed, ductility 3=6795
 - U, irradiation growth 3=8480
- Collections of physical data**
- Only comprehensive works of reference are listed here.
 - gases, harmonic oscill. vibr. contribs., tables 3=23926

Collections of physical data — contd

- nuclear handbook 3=2146
- Planck function for terrestrial temps. 3=18511
- point symmetry groups and antisymmetry types, tables 3=23424
- radioactive decay correction tables, 27 nuclides 3=15135
- transition probabs. calc. for 70 elements 3=19917

Collision processes

- See also Atoms, electron scattering; Field theory, quantum, interactions; Fundamental particles; and under the individual particles; Ionization; Nuclear forces; Nuclear reactions; Scattering, particles.
- afterglows, ion-neutral collisions meas. 3=5642
- atom-atom, resonance effects 3=6364
- atom-atom scatt., thermal energies, cross-sections 3=15306
- atom-ion, rel. to electron loss 3=712
- atom-molecule, collisions with mols., resonance, semiclassical approx. 3=22612
- atomic, low-energy, charge transfer 3=10477
- atomic recomb., 3-body collisions 3=6424
- atomic, resonant charge exchange, theory 3=16909
- atomic, with crystal surface, energy transfer 3=25769
- atoms and mols., "rainbow" singularity 3=12784
- atoms, electronic-vibr. energy transfer, theory 3=6433
- atoms, hard-core type model 3=12783
- atoms, integral eqns. governing energy transfer 3=25305
- atoms, range in solids 3=10571
- atoms, velocity depend., rel. to interaction 3=15305
- atoms, $Z \leq 12$, stopping cross-sections in C 3=22510
- billiard-ball collisions, teaching device 3=11654
- charged particle system, collision integral 3=3770
- charged particles, correlative distrib. func., collision integral 3=4354
- classical, momentum approx., higher order 3=11677
- collision integral for charged particles in mag. field 3=5654
- conservation laws, from conformal invariance at high energies 3=12430
- cosmic rays, with H in space, radioisotopes prod. 3=619
- electron pairs, μ -e production 3=7878
- ethylene-SF₆, vibr. energy transfer 3=6434
- γ + N and π + N, near threshold 3=6032
- gas atom on solid surface, lattice theory 3=2707
- gases, three-particle scatt. operator 3=11827
- high-energy interaction on "molecular model" of elementary particles 3=12537
- high-energy particles, yield spectra 3=2224
- hydrogen, ortho, and diffusion, 20.35°K 3=8312
- inert-gas ions and atoms with metal surface, energy transfers 3=22511
- ionized gases, by ion cyclotron reson. 3=21697
- ionized gases, review 3=12078
- ions, charge transfer, symmetrical resonance 3=1938
- ions, study methods 3=7439
- lifetimes and thermodynamics of real gases 3=9496
- many-body, collision lifetimes theory 3=9351
- mechanical, meas. by linear air trough 3=1646
- methyl ether-CCl₄ and SF₆, vibr. energy transfer 3=6434
- methyl ether-methyl chloride, vibr. energy transfer 3=6434
- molecular, energy exchange, approx. solns. 3=6430
- molecular, relax. expts. rel. to transition probab. 3=6379
- molecular, rotational energy transfer, theory 3=6435
- molecular, vibr. transition probab., theory 3=6432
- molecules, rotational transitions, rigid-body approx. 3=6436
- μ -mesons, relativistic, energy loss rate 3=7882
- multi-particle, relativistic partial wave expansions 3=14896
- neutron transfer in nuclear collisions 3=4654
- nucleon-nucleon, multiple π -meson prod. by bremsstrahlung 3=19670
- nucleons, with heavy emulsion nuclei at $>10^{12}$ eV 3=4382
- "parity-unfavoured", forward and backward "selection rule" 3=24637
- particle decay in condensed matter at high energies 3=22095
- particle effective interaction radius, estimation 3=5974
- peripheral type, Regge pole hypothesis 3=22088
- stable bound states for eqns. of motion, n-dimensions 3=7105
- three equivalent particles, interaction energy 3=17206

Collision processes — contd

- three-particle scatt., planar, formal theory 3=13999
 - three particles prod. near threshold, ang. distrib. 3=22096
 - two-electron capture by He protons, calc. 3=367
 - vibrational energy exchange 3=2546
 - C₂F₆, with CHF₃, CF₄ and SF₆, vibr. energy transfer 3=6434
 - CO, optical collision diameters 3=9511
 - CO₂, vibration deactivation by collision 3=6441
 - Cs atom, with slow Cs⁺ ions, meas. 3=4724
 - DCl, optical collision diameters 3=9511
 - H⁺ + H(1s) → H(1s) + H⁺, cross-section calc. 3=1938
 - H₂, para, rotational energy transfer 3=6435
 - H-H, electronic-vibr. energy transfer 3=6433
 - H₂-HD, rotational transitions, rigid-body approx. 3=6436
 - H₂, rotational excit. by He and H₂ 3=17623
 - He atoms, two, normal, Born approx. calc. 3=710
 - He gas, atomic excitation to 4'D state 3=2580
 - He³-C¹² scatt. at 28.5 MeV 3=8129
 - He²⁺ + He⁺(1s) → He⁺(1s) + He²⁺, calc. 3=1938
 - He³-He³ scattering, elastic, 3 - 12 MeV 3=12521
 - He³-S³² elastic scatt. at 28.5 MeV 3=8129
 - Hg atom-BC mol., electronic-vibr. energy transfer 3=6433
 - Hg atoms, metastable, disorientation 3=15301
 - N₂ ionization by N₂, 20-1000 eV meas. 3=4015
 - N¹⁴ + N¹⁴ → N¹³ + N¹⁵, scatt. approx. for long range forces 3=2222
 - Na atom-BC mol., electronic-vibr. energy transfer 3=6433
 - Ne⁺-Ne, electron capture and stripping 3=4725
 - O₂ ionization by O₂, 20-1000 eV meas. 3=4015
- Colloids**
- See also Electrophoresis; Emulsions; Gels; Sols; Thixotropy.
 - adsorption-flocculation of polymer 3=6891
 - associated, micelle formation, thermodynamics 3=5174
 - β FeOOH, colloidal crystals, structure 3=18408
 - in crystals lattices, phonon-scattering 3=22645
 - dielectric dispersion, in electrolyte soln. 3=13627-8
 - disperse systems, ionization equilibrium 3=21696
 - electrolytes, molec. wt. detm. from sedimentation and diffusion data 3=6938-41
 - electrolytic, partial specific volume and density of micelles 3=1404
 - and ferromagnetic domain obs. 3=23161
 - ferromagnetic, in polymers, rel. to mag. props. 3=20566
 - intermicellar liquid, and volume restriction on filtration 3=18464
 - light scatt. by spheres, meas. 3=5530
 - linear, order-disorder theory 3=3416
 - mechanical dispersions, soln.-grown polyethylene 3=1400
 - model for study of electrokinetic potl., pH, aggregation kinetics 3=3417
 - monolayer spread properties, solvent effect 3=11365
 - perylene, in n-heptane, luminescence, polarization, electric field effects, 77°K 3=18043
 - scattering, e.m. waves 3=19447
 - suspensions, lamellar, ion exchange on 3=11364
 - ultrasonics, effect on stability, book 3=6936
 - vibratory Brownian motion 3=54
 - Au, micro-crystal, electron diffraction, anomalous contrast (squamous) 3=1316
 - CsBr, colloid absorpt. band at 1050 m μ 3=25451
 - KCl with NaCl, optical absorption 3=930
 - Na, in NaN₃, e.s.r. rel. to temp. 3=3418
 - WO₃, colloidal crystals, structure 3=18408
- Colorimeters**
- reflectometers, 45° 0°, uniformity test 3=5510
- Colorimetry**
- See also Spectrochemical analysis; Spectrophotometry.
 - colorimetric ratios to chromaticity diffs., conversion 3=21177
 - colour diffs. in vegetable purées, single-no. expressions 3=5509
 - colour-matching responses to red light 3=16730
 - colour rendering, meas. and specification 3=24003
 - colour temperature, const. lines, rel. to CIE diagram 3=16729
 - distribution functions of a normal observer, corrections 3=21516

Colorimetry — contd

- review of three main accurate methods 3=16728
- stars, giants and supergiants, 3-colour 3=9225
- sun, absorptivity eval., ordinates selection 3=7031
- tolerance bands, and light source colour rendering 3=24002

Colour

See also Photography, colour.

- dye—polyelectrolyte complex, colour change by elec. field 3=3804
- dyes adsorbed on light-scattering materials 3=21515
- fluorescent paints, rel. to light source 3=14307
- objective, subjective methods of colour prodn. 3=3693
- theories, review 3=11881

Colour centres

- alkali halide crystals, α -centres 3=22837
- alkali halides, α - and γ -band formation 3=22835
- alkali halides, A-centres 3=22838
- alkali halides, F-band, rel. to electron bombardment 3=17808
- alkali halides, F-centres, bleaching, low-temp 3=22843
- alkali halides, F-centres, thermal stability 3=4890
- alkali halides, F & H-centres, formation, at low-temp. 3=812
- alkali halides, F- and V_K -centres, rel. to electron absorption 3=22694
- alkali halides, F, Z bands, Ca, Cd, Co doping 3=13012
- alkali halides, M-centres, formation rel. to irradiation 3=22730
- alkali halides, M-centres, X-ray generation 3=22845
- alkali halides, rel. to hardening by point defects 3=23364
- alkali halides, U \rightarrow F conversion by u.v. 3=20248
- alkali-halides, U-centres, vib. spectra 3=20247
- anthracene crystals, O-centres, rel. to luminescence 3=20533
- alkaline earth fluorides, expt. data 3=15516
- α -centres in alkali halides, fluorescence 3=17796
- diamond, colour changes when irradiated 3=20252
- electrocorundum 3=15515
- F band, binary mixed crystals of KCl, RbCl, KBr, shifts 3=20245
- F-centre band, spin-orbit splitting 3=13010
- F-centre, excited, lifetime and levels 3=10695
- F-centre, excited states, L band data 3=20244
- F-centres, e.s.r. absorption curves, shape calc. 3=15519
- F-centres, excited, lifetime 3=6546
- F-centres, internal photoeffect in elec. field 3=15453
- F-centres, KCl, electron and γ -irrad., hardening 3=23359
- F-centres, paramagnetic relaxation, in mag. fields 3=17797
- F'-centres, photoionization theory 3=20243
- F-centres, phonon-scattering 3=22645
- F, polaron capture 3=2838
- fluorite, rel. to geologic time 3=8458
- glasses, photosensitive, X-ray effects 3=8478
- halides, with O, S, Se, Te substitutional impurities, absorption spectra 3=3022
- ionic crystals, refractive indices 3=23034
- M-centres, thermal and optical stability 3=25303
- and nuclear spin—lattice relax. 3=20661
- particle trapping, thermally activated jumps, model 3=6500
- α -quartz, containing Ge, e.s.r. study 3=22832
- quartz, from dielectric loss, l.f., at low temps. 3=20157
- quartz, E'-centres, spin—lattice relax. 3=13009
- quartz, E₂'-centres, e.s.r. 3=13008
- quartz, Ge-doped, anisotropic 3=20238
- quartz, Ge-doped, e.s.r. 3=20239
- quartz, rose-coloured, due to Ti 3=8459
- ruby, γ -irradiated, rel. to thermoluminescence 3=23128
- U-centres, vibrational spectra, theory 3=17798
- V, nomenclature, ion signs in proper site 3=20249
- AgBr, anti-colour centre, e.s.r. absorption 3=6542
- AlLaO₃, V-centres 3=15670
- BaF₂, colouration spectra 3=2837
- BaF₂, Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
- Ca halophosphates, rel. to Cl/F ratio 3=22834
- CaF₂, colouration spectra 3=2837
- CaF₂, high-purity crystals, coloration 3=6541
- CaF₂, Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
- CsCl, levels, exoemission data 3=14618

Colour centres — contd

- Cs halides, F-centre spectrum, rel. to crystal structure 3=20242
- Cs halides, spin-orbit splitting 3=13010
- KBr, F'-type absorption bands 3=22840
- K Br, F'-type new absorption bands 3=815
- KBr, hydroxyl and U-centres, additively coloured 3=13013
- KBr, trapped-hole centres due to electron pulses 3=8460
- KBr, F₂⁺-centres 3=20240
- KBr—KI mixed crystals, F-bands 3=4889
- KBr, Li A-centres ENDOR study 3=25299
- KBr, U₂-centre, e.s.r. and photochem. 3=10696
- KBr, U-centres, i.r. absorpt. 3=13014
- KBr, due to X-rays, near fundamental edge 3=15517
- KCl, additively coloured, M-centre formation 3=4892
- KCl, bleaching at 77°K by F-band irradiation 3=6543
- KCl, containing Sr, F, Z₂ 3=23235
- KCl, divalent-doped, Z₁ centres, growth and bleaching 3=22846
- KCl, e.s.r. 3=23234
- KCl, F-aggregate centres, thermal prod. 3=4891
- KCl, F-band, rel. to electron bombardment 3=17808
- KCl, F-centres, aggregation, e.s.r. meas. 3=25302
- KCl, F-centres, formation and optical bleaching, rel. to impurity effects 3=22841
- KCl, F-centres, rel. to breakdown 3=23020
- KCl, F-centres, thermoluminescence, bleaching, effect of impurities 3=20246
- KCl, F-centres, rel. to inducing X-ray intensity 3=6545
- KCl, F and complex, X-ray prod. 3=25297
- KCl, F and F' centres, electronic—vibrational state interaction 3=22839
- KCl, F = F' reaction and F' lifetime 3=2840
- KCl, F and M-centre prod. by electrons 3=8461
- KCl, F, M, R-centres, prep., props. and models 3=2836
- KCl, F'-type absorption bands 3=22840
- KCl, F'-type new absorption bands 3=815
- KCl, hardening by colour centres 3=22833
- KCl, heavily γ -irrad., F- and M-band absorption 3=816
- KCl—KBr mixtures, due to 3 MeV electrons 3=10693
- KCl, levels, exoemission data 3=14618
- KCl, Li A-centres ENDOR study 3=25299
- KCl:LiCl, A-centre, dichroism meas. 3=17794
- KCl, motion of F-centres 3=6544
- KCl, M, R, N, temporary bleaching 3=818
- KCl, N-centres 3=820
- KCl, recombinations, rel. to glow luminescence 3=969
- KCl, rel. to γ -irrad 3=22842
- KCl, trapped-hole centres due to electron pulses 3=8460
- KCl—RbCl mixtures, due to 3 MeV electrons 3=10693
- KCl: Sr, Z₂-centres absorption, e.s.r. 3=25304
- KCl, U₂-centre, e.s.r. and photochem. 3=10696
- KCl, U-centres, i.r. absorpt. 3=13014
- KCl, V_K, rel. to u.v. absorption spectrum 3=3013
- KCl, due to X-rays, near fundamental edge 3=15517
- KI, F-band, rel. to electron bombardment 3=17808
- KI, motion of F-centres 3=6544
- LiF 3=22836
- LiF, coloration by various radiations 3=25298
- LiF, F-centres, e.s.r. study 3=11114
- LiF, F-centres, sharp absorpt. lines meas. 3=814
- LiF, F₂⁺ centres, rel. to specific heat 3=15439
- LiF, γ -irrad., F and M-centres 3=25300
- LiF, identification 3=10694
- LiF, by irradiation, line and band spectra 3=6540
- LiF, M-centres, rel. to neutron-irrad. 3=22868
- LiF, rel. to flow stress, interstitial mech. 3=2835
- LiF, trapped-hole centres due to electron pulses 3=8460
- MgO, F-centres, Γ_1 ° and Γ_2 ° state wave functions 3=25301
- MgO, F-centres, spin—lattice relaxation 3=817
- MgO, rel. to irradiation 3=22717
- NaCl, divalent addns., luminescence, absorpt. props. 3=813
- NaCl, F', and absorption, u.v., β -band maxima calc. 3=20487
- NaCl, F-centres after X-irrad., stored energy 3=2839
- NaCl, F-centres due to γ -rays and neutrons 3=8427
- NaCl, F-centre formation by X-rays 3=13011
- NaCl, F-centres, origin by X-irrad. 3=15518
- NaCl, F-centres rel. to X-ray, photoconductivity 3=4955

Colour centres — contd

- NaCl, F and complex, X-ray prod. 3=25297
 NaCl, F, X-ray formation 3=22844
 NaCl, levels, exoemission data 3=14618
 NaCl, trapped-hole centres due to electron pulses 3=8460
 NaCl, U_2 -centre, e.s.r. and photochem. 3=10696
 NaF, F-centre structure 3=20241
 NaF, M-centres, paramagnetism question 3=819
 $Na_2O \cdot B_2O_3 \cdot SiO_2$ glass, rel. to ionizing radiations 3=17795
 PbO, rel. to cation impurities 3=13075-6
 RbBr, F-centres, e.s.r. and ENDOR 3=15520
 RbCl, F-centres, e.s.r. and ENDOR 3=15520
 RbCl-KBr mixtures, due to 3 MeV electrons 3=10693
 RbCl, levels, exoemission data 3=14618
 SrF_2 , colouration spectra 3=2837
 SrF_2 , Eu^{2+} , Sm^{3+} impurities, electron phototransfer 3=951
 ZnS, red and blue, rel. to luminescence 3=22705
 ZnS:Cu, conversion of green to blue centres 3=25488
 ZnS:Tm 3=13210

Colour vision

- after images and anomalies 3=16467
 age and sex influence 3=16466
 chromatic induction, use of spinning disks 3=13974
 colorimetric ratios to chromaticity diffs., con-
 version 3=21177
 colour discrim., acquired deficiency, classification 3=5305
 colour discrim. theory, contrib. of threshold meas. 3=5304
 colour discrimination theory, review 3=5306
 colour-matching responses to red light 3=16730
 red-green brightness matches, adaptation effects 3=21176
 colours seen in flash of light 3=7075
 discrimination, rel. to bandwidth 3=16465
 distribution functions of a normal observer,
 corrections 3=21516
 flicker sensitivity at photopic levels 3=11640
 fluctuation theory of colour discrim. 3=5303
 heterochromatic target appearance, effect of retinal
 image stabilization 3=13975
 induced colour, factors affecting 3=11644
 Munsell value equation, inversion 3=13973
 neural net theory, application 3=3694
 objective and subjective colour effects 3=3693
 primates, red-green system, single cells 3=11643
 psychometric scale values correl. with chromaticity
 diffs. 3=13976
 quantum theory 3=3686
 red and blue electroretinograms at var.
 luminances 3=11641
 rendering props. of illuminants, psychophysical
 meas. 3=13972
 retinal experiments 3=1572
 saturation, quantitative estimates 3=11642
 tactile receptor theory 3=16461
 theories, review 3=11881
 yellow and white contrast sensitivities 3=11637

Columbium

See Niobium.

Combustion

- See also Explosions; Flames; Heat of combustion;
 Reaction kinetics.
 acoustic waves, effect, liquid fuel 3=16715
 conference, 9th international, Ithaca, N.Y. (1962) 3=21592
 gelatine, blasting, burning rate meas. 3=3394
 hydrocarbon-air mixture, ignition limits 3=25826
 in magnetohydrodynamic medium, with motionless
 piston 3=2116
 magnetohydrodynamic, in piston-driven medium 3=4262
 metals, in high temp. prod. 3=21602
 relaxation oscillations, in gas phase in combustion
 chambers 3=1389
 solids, effect on incident acoustic waves 3=280
 U powder ignition study 3=6916

Comets

- Abell (1953g), rel. to solar wind obs. 3=18625
 Abell (1954 V), orbit 3=13870
 absolute magnitudes 1954-60 3=9182
 activity at large heliocentric distance, review 3=9183
 book, by Richter, translation 3=13868
 characteristics of distant comets 3=5247

Comets — contd

- celestial mechanics, orbits, polygon approx.
 falsity 3=18586
 cometary debris, nature and production 3=23679
 diffusion 3=3552
 distant, tail composition curvature 3=21103
 head, highly-ionized plasma model 3=3553
 Humason (1961 e), prism spectrograms 3=16363
 Humason (1961e), spectra, photographic obs. 3=13871
 Humason (1961 e), spectrum 3=5248
 instability, and other props. 3=5249
 icy nuclei, structure 3=5250
 Jupiter group, distrib. 3=23680
 Mrkos (1957d) spectrum, 4737-6881 Å 3=11521
 observations 1959-60, conference 3=9139
 orbits, perturbation-of-elements method 3=3527
 origin 3=5249
 Seki-Lines 1962 B, brightness obs. 3=11519
 shock waves, due to solar particles, theory 3=9181
 spectra, C_2 mol. bands 3=8250
 spectra in tails, CO^+ band strengths 3=4743
 spectrum, Ikeya (1963a), C_2 spectrum 3=18624
 tektites, formation, cometary mech. 3=11522
 van Gent-Peltier-Daimaca (1944 I), orbit 3=16362
 wave motions in ionized tails 3=13869
 Wilson 1961 d, decametric radiation 3=5277
 Wilson-Hubbard (1961 d), spectrum 3=5246
 (1962c) Seki-Lines, spectrum 3=3554
 CH^+ ($^2\Pi - ^1\Sigma$) cometary band, rot. temp. 3=25118

Compasses

No entries this year

Compressibility

- See also High-pressure phenomena and effects.
 alkali halides, calc. 3=17627
 alkali halides, shock high press. 3=18179
 alkali metal halides, and temp. derivatives 3=13389
 alloys, rel. to impurity electronic structure 3=22757
 near critical point, rel. to co-existence curve 3=3786
 hard sphere system 3=23924
 metals, effect of shock waves, thermodyn.
 description 3=9547
 metals, up to 9×10^4 atm. 3=6786
 molecular crystals, rel. to bond types 3=15985
 polyphenyls, linear, linear and volume 3=15985
 powders, liquid filled, longitudinal 3=11737
 relation to thermodyn. functions and u.s. velocity 3=7395
 solid with cylindrical ducts 3=18884
 solids; applic. of quantum mech. stress tensor 3=8373
 solids, at high press. 3=23311
 solids, theory 3=20705
 thermodynamic limitation on modulus 3=21273
 6061-T6 Al 3=17667
 Al, porous, dynamic $0.7 - 9 \times 10^{12}$ dyne/cm² 3=6787
 Ar, solid, optical det. 3=11147
 CsBr, calc., by sums in wave-vector space 3=20115
 Cu, porous, dynamic, $0.7 - 9 \times 10^{12}$ dyne/cm² 3=6787
 Fe-Ni, rel. to magnetostriction 3=6713
 He³, solid, rel. to temp. and pressure 3=1887
 He⁴, solid, to 2×10^4 bar 3=8762
 He⁴, solid, to 2×10^4 bar 3=8762
 KBr, calc., by sums in wave-vector space 3=20115
 KCl, calc., by sums in wave-vector space 3=20115
 Li, calc., accounting for exchange charge volume 3=23282
 MnAs 3=13226
 Na, calc., accounting for exchange charge volume 3=23283
 NaCl, calc., by sums in wave-vector space 3=20115
 Ni, porous, dynamic, $0.7 - 9 \times 10^{12}$ dynes/cm² 3=6787
 Pb, porous, dynamic $0.7 - 9 \times 10^{12}$ dynes/cm² 3=6787
 α -Pu, mechanical props. in compression 3=25602
 Si, rel. to temp. 3=18178
 SiO₂ glass, effect of fast-neutron irradi. 3=13330
 Sr formate, simple and dihydrate 3=23281
 Tl, hexagonal 3=11134

gases

- adiabatic, large and rapid, relaxation effects 3=21421
 Mercury reservoir for demonstrations. 3=151
 A, adiabatic, coeffs. 3=1728
 Ar, quantum hard-sphere model 3=21434
 D₂, quantum hard-sphere model 3=21434

Compressibility — contd**gases — contd**

- H₂, quantum hard-sphere model 3=21434
 H₂ and D₂, -175°C to 150°C, up to 2500 atm 3=23930
 He-N₂ system, 175-475°C and up to 100 atm 3=14192
 N₂, adiabatic, coeffs. 3=1728
 Ne, quantum hard-sphere model 3=21434

liquids

- alcohols, temp. depend. 3=21309
 benzene, temp. depend., X-ray study 3=21322
 cellulose acetate in acetone, var. with conc. and mol. wt. 3=14161
 equations of state repulsion law, polar liquids 3=3795
 esters, adiabatic, 10⁰-50°C 3=11795
 ether, temp. depend., X-ray study 3=21322
 ethyl cellulose in methyl alcohol, var. with conc. and mol. wt. 3=14161

- gases, liquified, temp. coeff. rel. to mol. wt. 3=7204
 at high pressures 3=23311

- lithium halides, aqueous solutions, adiabatic, from u.s. velo. 3=18812

- liquids, u.s. det., calc. of association 3=1684

- metal nitrate electrolytes, adiabatic, apparent molar 3=9456

- metals, molten, temp. coeff. rel. to mol. wt. 3=7204

- methyl siloxanes, temp. depend. 3=21309

- org. liquids, temp. coeff. rel. to mol. wt. 3=7204

- paraffins, temp. depend. 3=21309

- polymer solutions, var. with conc. and mol. wt. 3=14161

- polyvinyl acetate in benzene, var. with conc. and mol. wt. 3=14161

- H₂, liquid, normal and para, adiabatic 3=23880

- H₂O, lowering by LiNO₃ 3=18807

- He⁴, near λ curve, meas. 3=12018

- Hg amalgams, adiabatic, rel. to composition 3=16604

- LiF, from u.s. vel., 890-1040°C 3=5440

- NaF, from u.s. vel., 1025-1160°C 3=5440

- Rb halides, aqueous solns. 3=16623

Compton effect

- on deuterons, 190-250 MeV, cross-sections 3=2233

- double, electrons, differential cross-section, calc. 3=14935

- γ -rays for nuclear excitation 3=24857

- proton, appl. of dispersion relns. 3=24674

- protons, dipole "phase shift" approx. 3=5975

- on relativistic electrons 3=14934

- Ba¹³⁷, internal Compton effect meas. 3=2389

Computers

See Calculating apparatus.

Concrete

- acoustic radiation efficiency of panels 3=7300
 conductivity, thermal, in terms of constituents, e.g. moisture 3=17672

- radiation shielding, props. 3=2539

- shielding consts. for 8 types 3=17516

- γ -rays back-scattering 3=10077

- u.s. velocity meas. 3=21502

Condensation

See also Drops; Fog.

- Aitken cloud chamber, droplet growth, theory 3=302

- atoms on crystal surface 3=8923

- dropwise, heat transfer mechanism 3=12009

- entropy and enthalpy, rel. to condens. coeff. 3=19070

- film, in forced boundary-layer flow 3=300

- formation by controlled convection. 3=25886

- hoar frost formation on frozen water drops in electric field 3=11397

- humid air, nuclei due to u.v. irradi. 3=1870

- inhibition of spontaneous nucleation 3=303

- on ions to give liquid droplets 3=21712

- kinetic theory for various force laws 3=24115

- in mist, over liquid surface, dynamic equilibrium 3=5556

- nucleation of Ag on AgCl 3=16842

- nucleation, homogeneous, thermodynamics 3=3931

- nucleation of vapour deposits 3=1873

- nuclei, hypersensitive stable charged droplet 3=3933

- nuclei meas., down to 0.001 μ 3=18491

- steam-water globules interact., mech. and thermodyn. 3=297

Condensation — contd

- surface molecular flow distrib. from evaporation sources in vacuum 3=12011

- theory, critical point and metastable state 3=21634

- transfer between two surfaces, kinetic theory 3=14427

- van der Waals theory, distrib. functions 3=12006

- van der Waals theory, one-dim. model 3=12005

- vapour-liquid, homogeneous nucleation, kinetics 3=3932

- vapour-solid nucleation kinetics, theory 3=16843

- water from water vap.-inert gas mixture 3=14425

- water, nucleation theory, emendations 3=14426

- water vapour on Au substrate 3=21635

- water vapour, below -65°C, rel. to ice crystal formation 3=5082

- Yang-Lee theory 3=7393

- Cd, in vacuum, mechanism of crystallization 3=16036

- Hg on Ni base 3=301

- K crystal growth from vapour, unit coeffs. 3=3271

- Zn, in vacuum, mechanism of crystallization 3=16036

Conduction, electrical

- See also Conductivity, electrical; Contact resistance; Current, electrical; Photoconductivity; Resistance, electrical; Semiconductors; Skin effect; Superconductivity.

- alloy, with periodically varying composition, residual resist. 3=20260

- alloys, binary, disordered, residual resistivity, 1-electron theory 3=20261

- alloys, binary, rel. to long-range order 3=17814

- alloys, cast, eutectic, rel. to composition 3=20262

- alloys of transition elements in normal metals, low temp. anomalies 3=8496

- approach to metallic state 3=17812

- crystals, transport props., freqn. depend. 3=12937

- current fluctuations analysis 3=5615

- d.c., macromolec. substances 3=20367

- dielectric liquids, conference, Durham, 1963 3=18824

- discharge, hollow cathode, negative resistance, theory 3=378

- earth's outer mantle 3=23573

- electrolyte, binary, d.c., field distrib. and ion conc. 3=18448

- electron gas, in space-periodic field 3=782

- electron-phonon system, quantum statistics 3=6468

- electron transport in fields varying in space and time 3=22886

- electrons in lattice, tensor calc. 3=8481

- ferromagnetic-insulator-non-ferromagnetic,

- tunnelling current 3=6489

- ferromagnetic metallic substs., anomalies 3=10716

- ferromag. metals, resistivity, on localized d- electron model 3=827

- gas, electron diffusion cross-section 3=14199

- gases, electron transport, time-of-flight meas. 3=23940

- gases, ionized, low density, in axially symmetric mag. fields 3=19182

- general expression, "average energy gain", method 3=20258

- insulating films, electron transport mechanism 3=6611

- insulating liquids with water particles 3=9478

- insulating thin films, mechanism 3=22976

- insulator with traps, space-charge-lim. 3=8503

- interacting mag. particles system, conductivity tensor 3=8482

- ionic oxides 3=15611

- on irreversible-processes theory 3=18757

- lattice electrons in external fields, approx. calc. 3=2751

- liquids, pressure analysis of carriers 3=9479

- metal films, discontinuous 3=10724

- metal plate, apparent resist., free-electron theory 3=13039

- metal ultrathin films 3=15536

- metals, Boltzmann eqn. for inhomog. elec. fields 3=13030

- metals, effect of e-e scatt. 3=20265

- metals, effective mass inequality rel. to low-density carrier current. 3=2773

- metals, effective mass inequality rel. to low-density carrier current 3=8408

- metals, electron transport, conference 3=2686

- metals, liquid, theory and expt., review 3=21401

- metals, surface impedance in i.r. region 3=20434

- metals, temp. var., ion charge 3=20263

- mixed conductors, l.f. characteristics 3=2874

Conduction, electrical — contd

- molecular crystals, electronic cond., alternative to Bloch function 3=10710
- molecular gases, electron transport coeffs. 3=363
- molecules, metal-like, waveguide analogy 3=8219
- photographic emulsions, rel. to photochem. sensitivity 3=3899
- photon-induced electronic transitions in molecular crystals 3=10711
- plasma, a.c., ion correl. effects 3=9769
- plasma, dynamic stabilization, effect of mag. field 3=7513
- plasma, high-freq. in presence of direct current 3=1978
- plasma, high-frequency, in magnetic field 3=19244
- polaron drift mobility calc. 3=12951
- polycrystal, rel. to cond. of single crystal 3=10712
- polymeric dielectrics, rel. to irradiation 3=20378
- porous media impregnated with conducting liquid 3=20374
- rutile, pulse currents of 100 μ sec, ohmic cond. 3=13108
- semiconductors with arbitrary energy surfaces 3=17840
- semiconductors, calc., allowing for impurity ions 3=20288
- semiconductors, degenerate, h.f. cond. 3=25337
- semiconductors, hot carrier, freq. depend. 3=13048
- semiconductors, ionized impurity scatt., theory 3=25338
- semiconductors with non-equil. concns. 3=17841
- semiconductors, space charge limited 3=8501
- semiconductors, space-charge zones near surface, carrier motion 3=2859
- solids, Boltzmann transport eqn. 3=25226
- solids, impact ioniz. of centres by electrons 3=8502
- solids, sphalerite structure, dislocation cores, theory 3=2793
- solids, theory, and hot electron problem 3=824
- solids, unstable solns. of transport eqn. 3=23805
- spot cond. between moving plasma and cold electrodes 3=21755
- superconductors, a.c., lack of, theory 3=19102
- thin insulating barrier, Holm and Stratton tunnelling eqns. 3=24205
- transverse in strong magnetic field, rel. to electron and phonon mutual dragging 3=4901
- tunnel current oscillations in a magnetic field 3=13025
- tunnelling through thin films with traps, calc. 3=825
- vacancy-impurity pairs in metals, calc. 3=25320

Conduction, heat

See Heat conduction.

Conductivity, electrical

- See also Resistance, electrical; Semiconducting materials; Semiconductors; Skin effect; Superconductivity.
- $A_1B^IVX^VI$ compounds 3=2881
- air, Greenland ice cap 3=1449
- air, weakly ionized by X-rays 3=3839
- alkali halides, ionic conductivity, polarization effects 3=22977
- alkali metals, liquid, temp. depend. 3=18828
- alkali metals, temp. depend., theory 3=17815
- alloys, b.c.c., residual resistivity 3=3317
- aluminoborosilicate glasses, containing Fe, effect of Na_2O , 100-450°C 3=22936
- array of cond. spheres or cylinder, or noncond. cylinders 3=9711
- atmosphere, during thunderstorms 3=9034
- atmosphere, upper, calc. from rocket and satellite measurements 3=6970
- bimetallic conductor, skin effect 3=22889
- binary alloys, short range order effects 3=8901
- binary electrolyte, total resistance irreversibility effect 3=16174
- borax, proton polarization effects 3=8483
- β -brass, rel. to quenching 3=20268
- in cellulose, dry, mechanism 3=20377
- chlorophyll a 3=20401
- crystals, semiconductor, in magnetic field, calc. 3=6565
- crystals, strong electron-phonon interaction 3=15528
- cyclohexane, and ion mobilities 3=14148
- daltonides, anomalously composed, theory 3=10762
- dielectrics, bibliography 3=13104
- diodes, thermionic, inert gas, irradiation 3=2026
- earth, horizontally stratified, relative calc. 3=16195

Conductivity, electrical — contd

- earth, inhomogeneities, effect on electromag. field 140 c/s variations 3=16230
- electrical resistivity of fully ionized gas 3=9811
- elec. spark, column, temp. and cond. meas. 3=1948
- ethylene, electron transport, time-of-flight meas. 3=23940
- ferrites, rel. to granular struct. 3=1083
- ferromag. crystal, change on mag. 3=17927
- ferromagnetic massive metal and thin films, rel. to mag. fld. 3=6710
- gas in m.h.d. generator, effect of electron temp. elevation 3=24460
- gas, slightly ionized 3=7441
- gas, slightly ionized, electron velocity distrib. 3=12079
- gas streams, meas. 3=24156
- gas, weakly ionized in mag. fld. 3=7251
- gases, electron cond., rel. to velocity depend. of collision freq. 3=14763
- glass 3=20372
- glass, electronic conductivity, in irradiation 3=10870
- glass, semiconducting, rel. to crystallite detection 3=8921
- glasses, alkali free magnesia-lime, effect of Al_2O_3 3=17880
- glow-discharge tube, impedance-pressure characteristics 3=4061
- glow tubes, impedance meas., 300 c/s to 5 Mc/s 3=4054
- graphite, calcs. for hexagonal layer planes 3=10714
- graphite, neutron irradiation, chemically doped, low temp. 3=8485
- graphite, pyrolytic, anisotropy 3=20778
- graphite, pyrolytic, rel. to structure 3=826
- Group II-VI, surface 3=17900
- hexamethylbenzene, rel. to crystalline transition 3=10873
- hexane, liquid, current-stress curves 3=23900
- n-hexane, liquid, rel. to γ -irradiation 3=11804
- ice, d.c., four-electrode meas. method 3=3973
- ice, dispersion, rel. to lattice defects 3=10644
- ice, -150 to -80°C, ~50 kV 3=22980
- ice, proton transfer activ. energy 3=22979
- impedance meas., three-terminal system 3=1906
- insulator with conducting inclusions 3=22971
- iodine crystals, under v. high press., metallic conduction 3=17812
- ionosphere, anisotropic, and induced currents 3=9073
- ionosphere, anisotropic, and resonance 3=9075
- ionosphere, rel. to dynamo current system 3=13709
- liquid metals, electron correl. effects 3=23903
- magnetic alloys, dilute, exchange scatt. resistivity 3=8487
- mag. substs, review of Soviet work since 1958 3=1135
- measurement, five probe method, theory 3=21674
- measurement in situ for anisotropic media 3=343
- metal films, cond. electrons m.f.p. 3=15546
- metal films, support effects 3=22901
- metal in mag. fields, size effect 3=842
- metal in mag. fields, size effect 3=8493
- metal, very thin, rel. to gas adsorption 3=15549
- metallic plates resistance, temp. dependence 3=6561
- metals and alloys, mag., anomalies, spin-dependent scatt. theory 3=25319
- metals, conduc. electron momentum 3=4835
- metals, dislocations, Thomas-Fermi model 3=2801
- metals, electrodeless meas. 3=1907
- metals, electromigration, review 3=22829
- metals, ferromagnetic, low temp. depend. 3=6559
- metals, liquid 3=143
- metals, during melting 3=21402
- metals, non-magnetic 3=10715
- metals, review, particular reference to Frenkel's early work 3=22888
- metals, static skin effect, in strong mag. field 3=25223
- metals, temp. depend., effect of low-concn. impurities 3=4902
- molten metals and semiconductors, appar. 3=9475
- noble metals, rel. to stacking fault tetrahedra 3=12994
- non-transition metals, multivalent, lattice vacancy resistivity 3=4903
- permalloy, films, and coercivity 3=13641
- phthalocyanine, metal-free crystals, bulk currents 3=8528
- plasma, and bremsstrahlung spectrum, calc. 3=14563

Conductivity, electrical — contd

- plasma, fully ionized, h.f. cond. 3=7606
 plasma, ionized, r.f. conductivity 3=7554
 plasma, microwave conductivity 3=14577
 plasma, and stability, gravitational 3=21778
 plasma, turbulent 3=1663
 plasma, turbulent 3=16932
 plasmas, Cs-seeded, meas. near thermal equil. 3=24279
 plasmas, seeded flame, in strong elec. flds 3=19241
 polyenes, linear, cryst., calc. 3=4926
 polyethylene, effect of irradiation 3=10866
 polyethylene, γ -ray induced 3=10874
 polyethylene, micro-crystals, I-V characteristics 3=8558
 polyethylene, rel. to X-irrad. 3=20379
 quartz, Ag⁺ and Cu⁺ conduction, rel. to current and elastic oscillations 3=25412
 rare earth cpds. (24) 3=11038
 rare earth hexaborides, analysis 3=10763
 rare-earth metals, rel. to screw-type spin ordering 3=15465
 rare earth monosulphides and nitrides 3=20342
 rocks, equiv. cct determ. 3=19135
 rutile, Al-doped, rel. to O₂ pressure 3=15596
 rutile, slightly reduced 3=10842
 sea-water, rel. to pressure 3=18486
 sea water, var. with press. and temp. 3=14182
 semicond. slices, theory 3=851
 semiconductor, impurities, low temperature 3=22910
 semiconductors, cross-sectional variation, meas. 3=17844
 semiconductors, dislocations, elec. props. 3=25335
 semiconductors, electrodeless meas. technique 3=342
 semiconductors, impurity, low temp., calc. 3=20292
 semiconductors, during melting 3=21614
 semiconductors, nonequil., decay, two recomb. centres, calc. 3=17833
 semiconductors, due to self-activation 3=17842
 snow, d.c., -50 to -8°C 3=6612
 solid soln. alloys, correl. with temp. coefft. of resist. 3=15534
 solids, relation with current density at optical freqs. 3=8484
 spinels, vanadium, rel. to interatomic distance 3=12934
 surface resistance measurement four-electrode system 3=9692
 Teflon, γ -ray induced 3=10874
 toluene vapour, h.f. resistance 3=9515
 transition element compounds, rel. to internal fields 3=4798
 transition metal oxides, rel. to internal friction 3=10836
 triglycine fluoroberyllate, nr. phase transition pt. 3=17924
 tunnel contact current, quantum oscill. in mag. field 3=22908
 water, deionized, increase by ultrasonics 3=18830
 water, rel. to (H₂O)₄ cubic complex formation 3=23868
 water vapour, h.f. resistance 3=9515
 wires, during rapid explosion 3=8488
 Ag, change due to torsional deform., law 3=8490
 Ag, electrotransport mobility of Sn impurities 3=8433
 Ag films, surface, transverse electric field effects 3=15541
 Ag, granular films, flicker effect 3=15540
 Ag halides, ionic 3=13007
 Ag, scattering cross-sections and charges of impurity ions 3=17813
 Ag, subject to large plastic strains 3=13036
 AgBr, defect electron cond., rel. to reaction with Br₂ 3=6912
 AgCl, defect electron cond., rel. to reaction with Cl₂ 3=6912
 AgCl, electron drift mobility, 70-350°K 3=6486
 AgI, under v. high press., metallic conduction 3=17812
 AgSbTe₂, resistivity, 80° to 300°K 3=13144
 AgSbTe₂-AgBiTe₂, -PbTe and -SnTe systems 3=10900
 Ag₂Se, 80°-600°K 3=2926
 Ag₂Te evap. films 3=833
 Ag₂Te, +20° to -190°C 3=20343
 AgTiTe, resistivity rel. to temp. 3=874
 Ag-Zn, β , β' and ζ -phases 3=8396

Conductivity, electrical — contd

- Al alloys, rel. to solute conc., Guinier-Preston zones 3=8877
 Al alloys with Mn, Cu, Si, microheterogeneities study 3=1347
 Al, and crystal point defects, due to α -rays and cold working, temp. var. 3=17816
 Al, electron irradi. effect, recovery 3=15489
 Al film, evaporated, in vacuum 3=8494
 Al films, rel. to adsorbed O 3=16872
 Al, films, surface, transverse electric field effects 3=15541
 Al, 4.2°-1.65°K, rel. to sample size 3=2851
 Al, and hardness, changes on coldworking 3=13373
 Al, polycryst., resistivity rel. to excess vacancies and dislocation loops, 20°K 3=4907
 Al, residual resistivity, size effect 3=22890
 Al, resistance, 20°-58°K 3=2852
 Al, scattering cross-sections and charges of impurity ions 3=17813
 Al, super-pure after zone refining 3=20803
 Al thin films, cooled layers 3=4906
 Al-Ag alloys, residual, transport theory 3=25321
 Al-Ag, zone-hardened 3=10717
 Al-Cu alloy, rel. to clustering, deform. effect 3=18182
 Al₂O₃, resistivity, rel. to creep 3=17868
 Al₂O₃, single crystals, at high temp. 3=15610
 AlSb, Ta doping and high resistivity 3=13068
 AlSb-GaSb, conductivity and Hall effect 3=25352
 Al-Zn alloys, residual, transport theory 3=25321
 Al-Zn, zone-hardened 3=10717
 Ar, electron diffusion-mobility coeffs. ratio 3=4023
 Ar gas, electron mobilities, cloud chamber meas. 3=23941
 Ar, in magnetohydrodynamic generator 3=4263
 Ar and Ar-Ne mixtures, liquid, electron drift velocity 3=21400
 As films 3=17875
 As₂S₃ amorphous films, 3 to 8 μ m, I-V characteristics 3=889
 As₂Se₃, rel. to crystalline-vitreous transformation 3=10802
 Au, due to Ag and Zn impurities 3=25320
 Au, doped, resistivity, quenched-in, recovery, 20°-170°C 3=17818
 Au, electron-irrad., resistivity annealing spectrum 3=2846
 Au films 3=15543
 Au films, rel. to electrostatic charging 3=15545
 Au films, rel. to various support 3=15542
 Au, films, surface, transverse electric field effects 3=15541
 Au, granular films, flicker effect 3=15540
 Au, rel. to annealing after quenching 3=8464
 Au, scattering cross-sections and charges of impurity ions 3=17813
 Au, subject to large plastic strains 3=13036
 Au wires, rel. to annealing and quenching 3=4862
 Au-Ag alloys, changes on heating and quenching due to ordering 3=22894
 AuAl₃, liq. He to room temp. meas. 3=10718
 AuCu, temp. variation 20°-500°C 3=10720
 AuGa₃, liq. He to room temp. meas. 3=10718
 AuIn₃, liq. He to room temp. meas. 3=10718
 Au-Ni thin films 3=8580
 Au-Si complex deposits 3=20331
 Ba, effect of temp. and pressure 3=25323
 BaTiO₃, doped, and Hall effect, temp. depend. 3=8515
 BaTiO₃, effect of MnO₂ doping 3=8560
 Be, temp. depend. 3=3297
 Be-BeO-Au thin film, tunnelling structure 3=13069
 Bi 3=10808
 Bi, Esaki effect, nonlinear theory 3=25353
 Bi films, surface, transverse electric field effects 3=15541
 Bi, 4.2°-1.65°K, rel. to sample size 3=2851
 Bi, surface resistance 3=17697
 Bi base cast alloys, rel. to composition 3=20262
 Bi-Bi₂, melts 3=11806
 Bi-Bi₂, molten solns. 3=11805
 Bi borate glasses, d.c. resistivity rel. to temp. 3=891
 Bi₂S₃, single crystals 3=22937
 Bi-Sb alloys, rel. to mag. fld., 78°-295°K 3=4958

Conductivity, electrical—contd

- Bi₂Se₃, and doping mechanism 3=8516
 Bi₂Te₃, γ -irrad. 3=22712
 Bi₂Te₃₋₂Se₂, rel. to O content 3=860
 C, new phase above 150 kbar 3=18229
 C, pyro layers, effect of heat treatment 3=20272
 CO, electron diffusion—mobility coeffs. ratio 3=4023
 CO₂, electron diffusion—mobility coeffs. ratio 3=4023
 CO₂, electron transport, time-of-flight meas. 3=23940
 Ca, effect of temp. and pressure 3=25323
 CaF₂, fused, electronic & ionic, 1100°C 3=1394
 CaF₂, high-purity crystals, coloration 3=6541
 CaO films, rel. to temp. 3=20471
 CaO in ZrO₂ solid solution, ionic 3=8550
 Cd, electron-irrad., resistivity annealing spectrum 3=2846
 Cd, low temp. thermal cycling 3=3233
 Cd, molten, meas. 3=9475
 Cd oxide pressed powders with excess Cd or O, 77-400°K 3=22940
 Cd, resistance, 10° to 14°K 3=2852
 CdO films, doped and undoped 3=25359
 CdS 3=25360
 CdS, current impulses due to α -particles 3=6594
 CdS, effect of hydrostatic pressure 3=15548
 CdS, non-ohmic cond., rel. to u.s. amplification 3=12919
 CdS, resistivity, rel. to temp (200°-400°K), In-activation and pressure (up to 16 000 kg cm⁻²) 3=931
 CdS, space charge limited current, noise 3=8520
 CdS, space-charge-limited currents, modulation 3=862
 CdS, space-charge-limited, expt. 3=861
 CdS, space-charge limited injection currents 3=2907
 CdS, surface 3=17900
 CdS, thermally stimulated, elec. field effect 3=6592
 CdS, thermally stimulated, and field emission, 20-200°C 3=19299
 CdS, thin films, rel. to temp. 3=25363
 CdSb, pure and doped 3=17971
 CdSb, temp. var. 3=25358
 CdSb, type 3=25357
 CdSb, variation with temp. 3=2740
 CdSe, effect of X-rays due to electron irrad. 3=17873
 CdSe, impurity doped, cond. mechanism 3=20327
 CdSe layers, induced by electron irrad. 3=2910
 CdTe films, rel. to deposition temp. 3=23508
 CdTe, n-type, meas. 3=8519
 Ce, resistance, 10°-300°K, up to 10 000 kg cm⁻² 3=6558
 Ce soln. in molten CeI₃ 3=21404
 Co films, resistance rel. to thickness 3=15539
 Co, thin films 3=17822
 CoAl₂O₄, ionic and electronic 3=15589
 CoAsS, temp. var., and paramagnetism 3=6601
 CoCr₂O₄, ionic and electronic 3=15589
 Co-S 3=25734
 CoSi, -200°-+1200°C meas. 3=25427
 Cr, films, resistivity 3=18382
 Cr nitrides 3=865
 Cr-N alloys, dilute 3=6865
 CrSi, -200°-+1200°C meas. 3=25427
 Cs plasma, effect of electrode film barriers 3=21820
 Cs plasma, weakly ionized 3=12186
 CsAu, resistivity 3=20328
 Cs-Sb films, rel. to composition 3=8495
 Cs-Sb layers, var. with Cs content 3=8574
 Cu, and crystal point defects, due to α -rays and cold working, temp. var. 3=17816
 Cu, dislocations, Thomas-Fermi model 3=2801
 Cu, electrotransport mobility of Sn impurities 3=8433
 Cu, 4.5°K, resistivity, rel. to irradiation 3=10698
 Cu, granular films, flicker effect 3=15540
 Cu, and hardness, changes on coldworking 3=13373
 Cu, rel. to oxidation and reduction up to 600°C 3=2012
 Cu, resistivity recovery after electron bombardment at 4.2°K 3=8488
 Cu, scattering cross-sections and charges of impurity ions 3=17813
 Cu, with vacancies 3=15481
 Cu, wire, recovery after cold working at 78°K 3=20266
 Cu-base alloys, resistance at 35°C, rel. to neutron irradiation 3=11291
 Cu, in InSb, diffusion mechanisms 3=17783

Conductivity, electrical—contd

- Cu-Al alloy, vacancy formation by quenching 3=20868
 Cu-Al alloys, near solubility boundary 3=5132
 Cu₃Au alloy, heat treatment effect 3=3330
 CuFeS₂ 3=1027
 CuI films, oxygen-controlled 3=13071
 Cu-Ni wires, resistivity, rel. to neutron-irradiation 3=10719
 (CuO)_x(Mn₂O₃)_{1-x} 3=8521
 Cu-Zn, α -phase, 4.2°-300°K 3=20267
 Cu-Zn-Sb alloys 3=23466
 D₂, electron collision cross-sections in d.c. field 3=23942
 D₂, electron diffusion—mobility coeffs. ratio 3=4023
 Dy, 4.2-350°K 3=25322
 Er, 4.2-350°K 3=25322
 Er, rel. to screw-type spin ordering 3=15465
 Fe, b.c.c. and f.c.c., rel. to pressure 3=13523
 Fe, doped, neutron irrad. at 78°K 3=13034
 Fe, films, ~ 100Å, up to 300°C, and activation energy 3=15538
 Fe-group metals, resistance 3=10715
 Fe, 0.38-4.2°K 3=6560
 Fe, rel. to damage "threshold" and saturation of neutron irrad. 3=8759
 Fe sheets, skin effect 3=831
 Fe-Al, quenched, annealed, rel. to ordering 3=3327
 Fe₃Al, and equilib. diag. 3=3326
 FeAs₂, temp var., and paramagnetism 3=6601
 FeAsS, temp var., and paramagnetism 3=6601
 Fe-C, rel. to reaction of C with point defects 3=10702
 Fe-Co ternary alloys, residual resistivities 3=3103
 Fe-Cr alloys, quenched from over 800°C 3=5060
 Fe-Ni, in mag. field at low temp. 3=8489
 Fe(50%)-Ni(50%), ordered state development rel. to neutron irrad. 3=11056
 Fe-Si alloys, up to 1200°K 3=22905
 Ga films 3=17875
 Ga, liq., electron transport props. 3=1710
 Ga, liq., up to 160°C at const. volume 3=23902
 Ga, molten, meas. 3=9475
 Ga, resistance rel. to current, 1.2° to 1.4°K 3=17817
 Ga, very pure, temp. depend. at low temps., electron m.f.p. 3=22892
 GaAs, at and above m. pt. 3=5448
 GaAs, rel. to elec. fld, 4°-30°K 3=10813
 GaI-Ga₂I₃-Ga₂I₄ molten system 3=18827
 GaP, 78°-100°K 3=17879
 GaSb films, undoped, sputtered on glass 3=3357
 GaSb, n-type 3=10819
 Ga₂Te₃ (59.5-60.0 at.%) Te 3=10815
 Gd, 90-370°K 3=8497
 Gd-Er, effect of localized mag. moments 3=13033
 Gd-Lu, effect of localized mag. moments 3=13033
 Ge, bombarded by fast neutrons, meas. 3=10898
 Ge, Cu-doped, impurity conduction 3=10789
 Ge, dendritic strips, effect of growth conditions 3=18282
 Ge dendrite strips, structure 3=18281
 Ge, effective charge and mobility of Tl ions 3=25345
 Ge epitaxial films, meas. method 3=2889
 Ge films, effect of small amounts of O₂ 3=13062
 Ge films, effects of electronic interact. with CO 3=25346
 Ge films, rel. to evaporation parameters 3=20926
 Ge, grain boundaries in bicrystals, analysis 3=8508
 Ge, liq., charge carriers formulae 3=14167
 Ge-methylmethacrylate interface 3=20300
 Ge, molten, meas. 3=9475
 Ge, n-type, along tilt and twist grain boundaries 3=854
 Ge, n-type, anisotropy in high fields 3=15575
 Ge n-type bicrystal, cond. at grain boundary 3=8506
 Ge, n-type, 4°-25°K, general analysis 3=2894
 Ge, n-type, pres. and freq. depend. 3=20306
 Ge, n-type, variation in strong pulsating mag. flds. 3=2887
 Ge, 1.7-290°K, n-type, strongly doped with Sb 3=20302
 Ge, quasi-intrinsic, interelectron scatt. 3=20312
 Ge, rel. to electron-irrad. 3=22859
 Ge, rel. to K-ion bombardment 3=17851
 Ge, surface cond. after exposure to oxygen 3=4174
 H₂, anisotropic electron distrib., theory 3=12072
 H₂, electron collision cross-sections in d.c. field 3=23942

Conductivity, electrical — contd

- H₂, electron diffusion—mobility coeffs. ratio 3=4023
 He, electron diffusion—mobility coeffs. ratio 3=4023
 He, gas, partly ionized 3=11840
 He³ and He⁴ I liquids; electronic and ionic mobility 3=317
 HfO₂, meas. rel. to O₂ pressure 3=12957
 Hg, molten, meas. 3=9475
 Hg, up to 160°C at const. volume 3=23902
 Hg[Cd]Te—In₂[Ga₂Te₃], solid solutions 3=11301
 α-HgS, thermally stimulated 3=6600
 HgSe, rel. to high-pressure phase transition 3=3253
 HgTe—CdTe, rel. to composition 3=17890
 I, resistivity var. with temp. and press. 3=8524
 In, evap. mirror coatings 3=22678
 In films, rel. to adsorbed O 3=16872
 In, films, rel. to electrostatic charging 3=15545
 In films, rel. to size 3=15548
 In films and wires 3=15448
 In, 4.2°–1.65°K, rel. to sample size 3=2851
 In, resistance, 10° to 14°K 3=2852
 In wires, 4.2°K, polycryst., size effect 3=20273
 InAs, at and above m. pt. 3=5448
 InAs, effects of high pressure 3=17886
 InAs, at low temps. 3=6596
 InAs, n-type, resistance in strong magnetic fields, 20°–360°K 3=4925
 InSb, diffusion coefft. rel. to mobility 3=13074
 InSb, effects of high pressure 3=17886
 InSb films, undoped, sputtered on glass 3=3357
 InSb, p-type, rel. to valence band and hole scatt. 3=22947
 InSb, 77–450°K, 25–25kOe 3=25367
 InSb—Sb eutectic alloys 3=23401
 InSe, 300°–600°K 3=13073
 In₂Te₃—InAs 3=1345
 K, effect of capillary constraints 3=7410
 K, effect of pressure at low temps. 3=828
 K films, rel. to substrate structure 3=18389; 3=18391
 KBr, rel. to anion impurities 3=17944
 KCl, ionic, effect of OH[−] ions 3=18005
 KCl, rel. to anion impurities 3=17944
 KNbO₃ 3=16033
 K₂NbO₃F, temp. depend. 3=3306
 KSCN, room temp. to melting point 3=22983
 K—Sb films, rel. to composition 3=8495
 Kr plasma in anode-glow mode, neg. resistance 3=5635
 La soln. in molten LaI₃ 3=21404
 Li, effect of pressure at low temps. 3=828
 LiF, neutron-irrad., effect of irradiation temp. 3=2946
 LiF, rel. to neutron-irrad. 3=22981
 Mg, effect of temp. and pressure 3=25323
 Mg, low temp. thermal cycling 3=3233
 Mg, resistivity rel. to vacancies in quenched and cold worked specimen 3=25269
 Mg—Nd alloys, effect of Nd in resistivity 3=829
 Mg₂GexSi_{1-x}, 250–600°K meas. 3=13142
 MgO, pure and doped 3=15811
 MgO, rel. to secondary electron emission 3=14637
 Mn alloys, mag. Brillouin zone effects 3=20554
 MnB, rel. to electronic structure 3=6488
 Mn_{1-x}Fe_xO₄, heat treatment depend. 3=22949
 Mn ferrite monocrystals 3=20334
 Mn—Si alloys 3=871
 Mo, rel. to radiation damage recovery 3=8470
 Mo—Fe, low temp. behaviour 3=13035
 Na, electron diffusion—mobility coeffs. ratio 3=4023
 Na, electron drift velocities 3=12077
 Na, effect of capillary constraints 3=7410
 Na, effect of pressure at low temps. 3=828
 Na films, rel. to thickness and temp. 3=15550
 Na, molten, meas. 3=9475
 Na₂B₄O₇(OH)₄·8H₂O, proton cond. 3=2904
 NaCl, ionic conductivity, time dependence 3=10872
 NaCl, new values, deformed crystals 3=890
 NaCl, rel. to anion impurities 3=17944
 NaCl, surface, rel. to water vapour pressure 3=22985
 NaNO₂, single crystals 3=23002
 Nb—Fe, low temp. behaviour 3=13035
 Nb₂O₅, rel. to O₂ pressure at 600°–1200°C 3=2923
 α-Nb₂O₅, 900° to 1400°C 3=8527
 α-Nb₂O₅, nonstoichiometric 3=6602

Conductivity, electrical — contd

- Nd soln. in molten NdI₃ 3=21404
 Ni, films, ~ 100Å, up to 300°C, and activation energy 3=15538
 Ni films, thin, rel. to thickness 3=17823
 Ni, films, at 300°K, resistivity 3=4905
 Ni, and hardness, changes on coldworking 3=13373
 Ni layer, separated from Al, tunnelling 3=6489
 Ni, mobility of Sb¹²⁴ in d.c. 3=15511
 Ni, pure, in mag. field at low temp. 3=8489
 Ni, rel. to density of electronic states 3=6488
 Ni thin films, resist., 2° to 300°K 3=832
 Ni thin layers, rel. to ferromag. Curie pt. 3=1077
 Ni₃Fe—(3%)Mo, rel. to K-state formation, rel. to excess vacancies 3=13531
 Ni ferrite, change on mag., anisotropy 3=17927
 Ni ferrite, single crystals 3=3270
 Ni—Mn alloy, effect of plastic deform. 3=5133
 Ni₃Mn, and ordering kinetics 3=3329
 NiO, p-type 3=20338
 Ni—Pd alloy, effect of hydrogenation 3=20269
 Ni—S 3=25734
 Ni—Se 3=25734
 NiZn ferrites, 50–350°C 3=20618
 Ni—Zn ferrites 3=20336
 Ni—Zn ferrites, pressure depend. 3=4940
 Ni—Zn ferrites, rel. to porosity 3=4939
 O₂, weakly ionized by X-rays 3=3839
 P, black, crystalline 3=17891
 P—Ni films 3=10725
 Pb films, rel. to adsorbed O 3=16872
 Pb films during vacuum deposition 3=25327
 Pb, 4.2°–1.65°K, rel. to sample size 3=2851
 Pb, rel. to data on cond. electrons 3=22677
 Pb, resistance, 10° to 14°K 3=2852
 Pb, scattering cross-sections and charges of impurity ions 3=17813
 Pb base cast alloys, rel. to composition 3=20262
 PbCl₂, pure and doped with KCl and LaCl₃ 3=10645
 PbCl₂, TlCl- or BiCl₃-doped, electrolytic 3=17926
 PbI₂, ionic, rel. to photodecomposition 3=2921
 PbS, effect of Cu doping 3=15593
 PbS, piezoresistance effect anisotropy 3=6599
 PbS, pressure depend., up to 9000 kg cm^{−2} 3=22948
 PbSe—Bi₂Se₃ system, rel. to composition 3=25742
 PbSe—Sb₂Se₃ system, rel. to composition 3=25741
 Pb silicate glasses, rel. to "water" content 3=2945
 PbTe, pressure depend., up to 9000 kg cm^{−2} 3=22948
 PbTe, resistivity, rel. to carrier conc. and temp. 3=867
 PbTiO₃—BaZrO₃ system 3=13481
 PbTiO₃—LaAlO₃, rel. to phase diagram 3=20767
 PbTiO₃—LaFeO₃ system, temp. and LaFeO₃ conc. var. 3=20852
 PbTi Zr_{1-x}O₂ ceramics, p-type processes 3=25400
 Pd, rel. to H content, hysteresis 3=22896
 Pd alloys, binary, meas. and theory 3=1126
 Pd—Fe, low temp. behaviour 3=13035
 Pr soln. in molten PrI₃ 3=21404
 Pt, temp. var., 0–900°K and thermometers < 90°K 3=17819
 Pt very thin films, rel. to adsorption of gas 3=15549
 Pu nitrides and sulphides 3=16473
 Rb films, rel. to substrate structure 3=18390
 Sb films, evaporated 3=20701
 Sb films, surface, transverse electric field effects 3=15541
 Sb, molten, meas. 3=9475
 Sb₂S₃—Sb₂Te₃ system 3=15585
 Sb₂Te₃ films, meas. 3=8514
 Sc, 1.38°–358.8°K 3=10722
 Se, effect of grain size, various dopants 3=22951
 Se, grey, shock wave effect 3=830
 Se, polycrystalline, rel. to oxygen exposure 3=17893
 Se, under v. high press., metallic conduction 3=17812
 Se, vitreous, space-charge limited 3=13081
 Si, heat treatment effects 3=15579
 Si, quasi-intrinsic, interelectron scatt. 3=20312
 Si, rel. to electron irrad. 3=22859
 Si, resistance, rel. to pressure 3=18228
 Si, zone-refined, p-type, in-pile coeff. 3=17867
 SiC, n-type, transient recomb. meas. 3=10840

Conductivity, electrical — contd

- SiO₂, surface, due to adsorbed molecules 3=25318
 Sn, bulk, tunnel effect 1.36°-3.6°K 3=1901
 Sn films, rel. to adsorbed O 3=16872
 Sn, films, rel. to electrostatic charging 3=15545
 Sn films during vacuum deposition 3=25327
 Sn, 4.2°-1.65°K, rel. to sample size 3=2851
 Sn, resistance, 10° to 14°K 3=2852
 Sn, resistivity, 3.75°-4.22°K, and residual at 0°K 3=8491
 Sn base cast alloys, rel. to composition 3=20262
 SnI₄, under v. high press., metallic conduction 3=17812
 SnO₂ films, impurity-free 3=17897
 Sr, effect of temp. and pressure 3=25323
 SrO.2B₂O₃ and SrO.4B₂O₃, lead-activated, rel. to luminescence 3=2925
 Ta, effect of lattice defects 3=13037
 Ta-Ta₂O₅-Au diodes, electron transport mechanisms 3=6611
 Tb, 1.4°-500°K meas. 3=18113
 Tb-Lu, effect of localized mag. moments 3=13033
 Te, anisotropy investig. 3=17820
 Te, liq., analysis 3=14168
 Te liquid, up to 850°K 3=9474
 Te, mobility of TI, temp. depend. meas. 3=17791
 Te, molten 3=9475
 Te, purified, rel. to structural defects 3=17898
 Te and Te-Se liquid solns. 3=3813
 Th, carbide-iodide, at high temp. 3=23378
 ThF₄, fused, electronic & ionic, 1100°K 3=1394
 Th-In alloys, rel. to temp. and press. 3=20886
 Th nitrides and sulphides 3=16473
 Ti ceramics, var. during ageing, relation to var. on injection into alkali halides 3=20380
 Ti, 80-90 kbar 3=20887
 Ti, sputtered films, effect of dissolved gases 3=25328
 α-Ti, anomalous, rel. to thermal electron transitions 3=20127
 TiC-WC-Co, volume resistivity, Co depend. 3=3316
 Ti-Cr alloys, up to 1100°K 3=22898
 Ti hydrides, 77°-300°K 3=13026
 TiO, due to d-bands 3=25235
 TiO, 80°-400°K 3=17894
 TiO₂, elec. aging and regeneration 3=23000
 TiO₂, I ∝ V², polarization and space-charge effects 3=22954
 TiO₂, rutile, bibliography 3=17963
 TiO₂, rutile, rel. to lattice defects 3=22955
 TiO₂, semiconducting, 2°-80°K 3=17895
 TI films, rel. to adsorbed O 3=16872
 Tl₂Te₃-Bi₂Tl₃ 3=18343
 U, effect of neutron irradiation 3=25325
 U, resistivity of interstitial atoms and vacancies 3=25326
 U, var. with heat treatment, 4.2°-100°K 3=20270
 UFe₂, resistivity meas. 3=1113
 U nitrides and sulphides 3=16473
 UO₂ single crystals, 90°-900°K 3=25372
 UO₂-ZrO₂ system, a.c. at high temps. 3=10882
 UO₃-U₃O₈, rel. to phase transition, 25°-200°K 3=25371
 V oxides, energy spectrum, current carriers 3=6605
 V₂O₃ crystals, resistivity meas. 3=2927
 W, effect of lattice defects 3=13037
 W, surface resistance, oscillatory, 1.6°K 3=2777
 W wires, hot resistivity 3=10723
 WC-Co, rel. to macroscopic structure 3=13497-8
 WO 3=13083
 W_xTa_{1-x}Se₂, x = 0.10-0.99 3=23029
 Xe, plasma in anode-glow mode, neg. resistance 3=5635
 YFe garnet, by spin waves, meas. 3=8374
 Y-Lu, effect of localized mag. moments 3=13033
 Yb, high-pressure, rel. to virtual bound state model 3=2756
 Yb, 20-40 kbars pressure, semiconductivity 3=17899
 Zn, 4.2°-1.65°K, rel. to sample size 3=2851
 Zn, by He temps. meas. 3=8492
 Zn, liquid and solid, first princs. calc. 3=8395
 Zn, low temp. thermal cycling 3=3233
 Zn, molten, meas. 3=9475
 Zn, resistance, 10° to 14°K 3=2852
 ZnF₂, fused, electronic & ionic, 1100°K 3=1394
 ZnO, effect of adsorbed O 3=6679

Conductivity, electrical — contd

- ZnO, light depend., role of ionized donors 3=9629
 ZnO, non-ohmic cond., rel. to u.s. amplification 3=12919
 ZnO, rel. to "edge" and green luminescence emission 3=3048
 ZnO-TiO₂-NiO ceramics, temp. coefft. 3=13117
 ZnP₂, red and black forms 3=16072
 ZnS, due to bombardment, model 3=13208
 ZnS, surface 3=17900
 ZnS : Cu 3=20345
 ZnSb, electrical properties, rel. to temp. 3=25373
 ε-Zn₃-Sb₂, 20-470°K 3=20346
 Zn₃Sb₂, rel. to semiconducting props. 3=15597
 β-Zn₃Sb₂, semiconducting, temp. var. 3=22956
 ZnSe, carrier mobility and shallow impurity states 3=10843
 ZnTe, carrier mobility and shallow impurity states 3=10843
 ZnTe, impurity doped, cond. mechanism 3=20327
 Zr, 51-59 kbar 3=20887
 ZrO₂, meas. rel. to O₂ pressure 3=12957
 ZrO₂, stabilized, 550°-1200°K 3=20376
 ZrO₂-CaO, fluorite phase 3=25728
 (87%)ZrO₂-(13%)La₂O₃, 1200°-1650°K 3=17901
- electrolytic**
 See also Chemical analysis, electrochemical; Ion velocity, electrolytic.
 alkali metal dissolved in molten alkali halides 3=18829
 binary electrolyte, alternating current 3=13610
 diffusion, restricted, interference optics study 3=5434
 ion relaxation field, by Poisson eqn. 3=20998
 meas. bridge, 4 electrode 3=11353
 nitrates and nitrites, fused, transport numbers 3=16172
 Onsager reln., testing for Na₂SO₄-H₂SO₄-H₂O 3=1680
 saline solutions, resistivity meas. apparatus 3=11352
 CeO₂, Ca-doped 3=17870
 HCl, aqueous, 300-383° 3=18450
 HCl solns., 50° 3=23547
 KCl, rel. to pre-freezing effects 3=3927
 K TcO₄, N/10 soln., 25°C, and TcO₄⁻ diffusion 3=16609
 N H₄TcO₄, N/10 soln., 25°C, and TcO₄⁻ diffusion 3=16609
 NaCl, aqueous, 300-383° 3=18449
 ZnCl₂, rel. to pre-freezing effects 3=3927
- measurement**
 by damping, cylinder rotating in a mag. field 3=19127
 electrodeless meas. for metal and semicond. melts 3=23904
 geophysical prospecting, four-point, resolving power 3=21024
 lamellae, nonuniform, van der Pauw's method 3=14467
 low resistance meas. by induction method 3=19126
 metals, low-temp., apparatus 3=9667
 of moving conductor, by magnetic probe 3=5598
 plasma, nitrogen, from temp. profile 3=7589
 plasma, without electrodes 3=5677
 polymers, drying techniques effect on results 3=4936
 RC method, feedback network 3=14466
 sea-water, oscillator circuits, freq. stability 3=14486
 semiconductor films, by Hall-effect parameters meas. 3=25776
 semiconductors, epitaxial and bulk, four-point probe 3=25341
 semiconductors, four-point probe 3=24160
 semiconductors, temp. depend., up to 1000°K 3=24159
 Cs and Cs-Ar gas mixtures, temp. depend. 3=23939
 Cu-Zn alloys, 4.2°-300°K 3=20267
- Conductivity, thermal**
 See also Heat conduction.
 dielectrics, improvement, by adding crystalline quartz 3=8544
 ferromagnetic metals, calc., temp. var. 3=20119
 on irreversible-processes theory 3=18757
 magnetite, natural crystal, 5.9°K 3=4829
 magnetoplasma, electronic thermal cond. 3=5668
 steel, Al, bond between surfaces, directional depend. 3=13984
 superconductors 3=330
 superconductors, convective 3=328
 wire, var. with dia., and m.f.p. 3=22672
 Al, steel, bond between surfaces, directional depend. 3=13984
 D₂ plasma, radially constricted 3=16926
 Fe, meteoritic 3=11526

Conductivity, thermal — contd

- LaCo nitrate, rel. to spin-phonon interactions 3=8375
 Ti_2Te_3 - Bi_2Ti_3 3=18343
 V, superconducting 3=1904
- gases**
 apparatus for gases in critical region 3=3832
 kinetic theory, Maxwell-Chapman method 3=3825
 measurement in crit. region, effect of convection 3=3834
 measurement, errors due to relaxation effects 3=7372
 mixtures, and viscosity 3=18849
 mixtures, translational, formulae 3=11829
 molecular gas, rel. to rotational degrees of freedom 3=1727
 paramagnetic gas in magnetic field. 3=171
 plasma, nitrogen, from temp. profile 3=7589
 polyatomic gases, binary mixtures 3=21443
 A-He mixture 3=168
 A-Ne mixture 3=168
 Ar, meas. at high densities 3=11832
 CO_2 , in critical region 3=3833
 CO_2 , meas. in crit. region, effect of convection 3=3834
 CO_2 near critical pt. 3=21589
 Ne-He mixture 3=168
 N_2 and O_2 , their cpds., and mixtures 3=21443
 O_2 - H_2O mixtures, 300° to 1100°K 3=16655
 O_2 , 300° to 1100°K 3=16655
 PCl_5 , dissociating system 3=9503
- liquids**
 metals, phonon part, neutron scatt. study 3=12462
 He^3 - He^4 , λ -pt to 0.6°K 3=3939
 He II, meas., effects of channel geometry 3=24130
 K in liquid ammonia 3=14149
 Li in liquid ammonia 3=14149
 Na in liquid ammonia 3=14149
 Ne 3=18802
- solids**
 alkali and rare-earth hexaborides 3=25210
 alkaline earth oxides, 450°-720°K 3=25209
 carbon, thermal diffusivity 3=14296
 ceramics, pressed powders 3=25217
 concrete, in terms of constituents, e.g. moisture 3=17672
 crystals, perfect dielectric, without umklapp processes 3=25208
 graphite, electron irradi. effects, annealing 3=10615
 graphite, pyrolytic, anisotropy 3=20778
 heated wire, change from elec. stress 3=11965
 Kramers salts 3=12933
 lattice, in disordered crystals, high temp. 3=2738
 metals, effect of e-e scatt. 3=20265
 metals, low-temp., apparatus 3=9667
 non-metals, by lattice-defect phonon-scattering 3=22645
 quartz, fused 3=4831
 rubbing bodies, unequal extension case 3=24082
 ruby, in optically excited state 3=10612
 semiconductor alloys, at high temps. 3=10616
 superconducting and normal states, ratio, calc. 3=331
 superconducting 3=21650
 superconductors, BCS theory 3=1892
 superconductors, interphase boundaries 3=24139
 III-V cpds. 3=2914
 III-IV cpds., 300°-1200°K 3=10611
 ABX_2 covalent compounds 3=2739
 Ag, phonon and electron components, separation methods 3=12930
 $\text{AgSbTe}_{2-x}\text{Se}_x$ 3=875
 Ag_2Se , 80°-600°K 3=2926
 β - Ag_2Te , liq. N temp. to room temp. 3=837
 Al, oscillatory, rel. to magnetoresistance 3=20123
 AlO_2 , doped with mag. impurities at low temps. 3=2742
 Al_2O_3 , powders 3=21584
 Al_2O_3 , thermal diffusivity 3=14396
 Au, Kapitza resistance meas. 3=12017
 Au, phonon and electron components, separation methods 3=12930
 Au-Co alloys at 3°-35°K, meas. 3=10614
 B, 4°-300°K, temp. depend. 3=25211
 BeO, from axial temp. distrib., -200 to +150°C 3=12932
 BeO, rel. to neutron-irradiation, 100°-300°K 3=20255
 Bi 3=10808

Conductivity, thermal — contd

- solids — contd**
 $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3}$ 3=10895
 $\text{Ca}_x\text{Ba}_{1-x}\text{TiO}_3$, 40°-150°C 3=20122
 CdGeAs_2 3=8518
 CdGeAs_2 , 100-700°K 3=20118
 CdSb , variation with temp. 3=2740
 CdSnAs_2 3=8518
 CdSnAs_2 , 100-700°K 3=20118
 CdTe , fall nr. Debye temp. rel. to acoustic-optical phonon scatt. 3=17670
 Cr nitrides 3=865
 Cu alloys, dilute, lattice conduct. meas. 3=15450
 Cu, Kapitza resistance meas. 3=12017
 Cu-Pb-Cu sandwiches, at liq. He temp. 3=24150
 Cu, phonon and electron components, separation methods 3=12930
 Fe-Ni, in mag. field at low temp. 3=8489
 $\text{FeSi}_{1-4}\text{CoSi}_4$ alloy 3=5547
 Ga, anisotropy, 83-293°K 3=17671
 GaAs, rel. to high defect concn. 3=791
 (Ga,In)As alloys, disordered, lattice theory 3=25207
 Ga, 300°-1200°K rel. to doping 3=10611
 Ge, doped with Sb and Ga, piezothermal cond., liq. He temp. 3=10766
 Ge, lack of difference between p- and n-type 3=2741
 Ge, rel. to fast neutrons 3=17674
 Ge-Si alloys, at high temps. 3=10616
 Ge-Si alloys, disordered, lattice theory 3=25207
 Ge, 300°-1200°K, rel. to doping 3=10611
 Ge^4 , lattice, rel. to density, theory 3=321
 Ho ethyl sulphate, optical phonons model 3=10613
 In 3=17668
 InAs, at low temps. 3=6596
 In-Bi (3 at. %), superconductive, 2.16°K, var. mag. field 3=12032
 InSb, change in mag. field 3=1850
 InSb (1.2-4.0°K) 3=4830
 InSb-Sb eutectic alloys 3=23401
 In, Te, -InAs 3=1345
 KBr, rise nr. Debye temp. rel. to optical phonon heat transport 3=17670
 KCl, fall nr. Debye temp. rel. to acoustic-optical phonon scatt. 3=17670
 $\text{LaCo}(\text{NO})_{12}$, 24H₂O and phonon scatt., paramag. res., low temps. 3=15427
 LiF, Kapitza resistance meas. 3=12017
 Mg_2Ge , rel. to temp. to 300°C 3=12931
 $\text{Mg}_2\text{Ge}_x\text{Si}_{1-x}$, 250°-600°K meas. 3=13142
 MgSi , rel. to temp. to 300°C 3=12931
 Mo, phonon and electron components, separation methods 3=12930
 Mo silicides, electron and lattice contribs. 3=25213
 Mo, up to 1700°K 3=14395
 MoS_2 , at 80°C 3=8376
 NaCl, by dislocation phonon scattering 3=22646
 NaCl, effects of Li^+ , I^- , Rb^+ , Ag^+ , Br^- , K^+ impurities 3=22644
 NaCl, fall nr. Debye temp. rel. to acoustic-optical phonon scatt. 3=17670
 NaCl, rel. to phonon scatt. by impurity ions 3=6473
 NaCl with Ag, Br, K impurities, 100° to 380°K, rel. to phonon scattering 3=10584
 NaCl, with CaCl_2 impurity, temp. var. 3=20120
 NaI, rise nr. Debye temp. rel. to optical phonon heat transport 3=17670
 Nb, 1.6-15°K meas., electronic and lattice 3=25215
 Ni, pure, in mag. field at low temp. 3=8489
 $\text{Ni}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$ 3=4831
 Ni-Zn ferrites, 20°-400°C meas. 3=25214
 NiZn ferrites 3=17669
 NiZn ferrites, 50-350°K 3=20618
 PbSe, rise nr. Debye temp. rel. to optical phonon heat transport 3=17670
 $\text{PbSe-Bi}_2\text{Se}_3$ system, rel. to composition 3=25742
 $\text{PbSe-Sb}_2\text{Se}_3$ system, rel. to composition 3=25741
 Pt, 0-950°C, possibility as reference material 3=25216
 Si, Kapitza resistance meas. 3=12017
 Si, lattice cond., rel. to impurities 3=10610
 Si, 680-1000°K 3=22671

Conductivity, thermal — contd
solids — contd

- Si 300°-1200°K, 3=10611
 Si, 300°-1400°K 3=15449
 Te single crystals, 80-650°K 3=6483
 U, effect of neutron irradiation from electrical conductivity variation 3=25325
 UC, 100°-700°C 3=7079
 W, Kapitza resistance meas. 3=12017
 W, phonon and electron components, separation methods 3=12930
 W, up to 1700°K 3=14395
 $W_xTa_{1-x}Se_2$, $x = 0.10-0.99$ 3=23029
 $ZnGeAs_2$, 100-700°K 3=20118
 $ZnGeAs_2$ 3=8518
 $ZnSnAs_2$, 100-700°K 3=20118
 $ZnSnAs_2$ 3=8518

measurement

- apparatus for gases in critical region 3=3832
 apparatus, precision, for low cond. 3=4831
 effect of radiation loss 3=19046
 electrical conductors at high temp. 3=14395
 gases in crit. region, effect of convection 3=3834
 gases, errors due to relaxation effects 3=7372
 guard-dome, hot plate apparatus, temp. unbalanced 3=21583
 high temp., Pt as reference standard 3=25216
 insulating materials, apparatus 3=11977
 insulators, square guarded hot plate, errors 3=3911
 loose-fill materials at high temps., radial-flow appar. 3=21584
 from thermal diffusivity meas., acoustic freqs. 3=11976
 poor conductors, rapid detm. method and apparatus 3=9636
 solids, thermal diffusivity meas. with electron bomb. heating 3=14396
 solids, by stopwatch, 20-200°C 3=19045
 standards, use of NaCl and KCl 3=5548
 thermal comparator, absence of directional heat flow 3=272
 thermal comparator 3=276
 thermal resistors for He-temp. use 3=14433
 thermoelectric materials, using Peltier effect 3=5547
 use of thermoelec. cooling elements 3=19044
 viscous materials 3=16825

Conferences

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- semiconductor physics, Exeter (1962) 3=6567
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- semiconductor physics, Prague 1960, closing speech 3=2862
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- solid solutions, Orsay (1962) 3=6873
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- X-ray investigation of materials, Leningrad, June 1961 3=11243
- X-ray spectroscopy, Kharkov, 1961 3=3028

Constants

- fine structure, non-dimensional nature 3=16486
- fundamental particle constants and physics laws, relation 3=14926
- h/e, by photoelectron method 3=1575
- M/L for double galaxies 3=3606
- Planck, in general relativity theory 3=1606

Contact angle

See Capillarity; Surface tension; Wetting.

Contact potential

- liquid-junction, redox meas. 3=23546
- meas., vibrating electrode, all-metal, for parasitic elimination 3=16970
- metal films, change during gas adsorption 3=9824
- metal-insulator-metal barriers 3=9709
- and work function, W, 311 plane, and temp. var. 3=7626
- PbS, surface, changes on illumination 3=20414
- CdSe, films, light-induced changes, wavelength depend. 3=23014

Contact resistance

- carbonized anthracite aggregates, after air oxidation 3=8545
- Si-Si crystals 3=10796
- ZnS, ohmic contacts 3=8530

Convection

- air, salt-induced 3=16218
- anisotropic media, variational principle, least squares procedure 3=21588
- around arcs in nozzles, forced, theory 3=7485
- binary mixtures, liquid and gaseous, effect of thermal diffusion 3=19047
- boundary layers, turbulent, forced 3=11968
- buoyant fluid, isolated masses, calc. 3=5549
- between concentric cylinders, computer calc. 3=11978
- cellular free interfacial, matter transition at fluid boundaries 3=21587
- earth's mantle, harmonic currents and continental drift 3=9009
- flow in circular pipe, with and without heat sources 3=14397
- flow past vertical plate with suction 3=3912

Convection — contd

- fluid boundaries, free interfacial 3=21586
- fluids, Nusselt numbers 3=19037
- forced, turbulent flow round plate 3=19036
- free, laminar flow of elec. cond. fluid in mag. fld. 3=2114
- gas films in powders 3=3907
- gases, flow velocity profiles meas. 3=153
- heat transfer bibliography 3=7364
- heated tube in water, reduction rel. to vibrations 3=19048
- laminar, over horiz. source of heat 3=9637
- layer along vertical flat plate, turbulence transition 3=277
- line and point heat sources 3=21591
- liquids, forced, in a bend 3=9426
- magnetic field and rot. effects 3=21585
- magnetohydrodynamic, vibrational instability 3=5830
- natural, with forced lamina flow in vertical round tubes 3=103
- penetrative, unstable to stable layers 3=11763
- plasma conductor subject to forced convection 3=21777
- plates, stationary layer, heating 3=16826
- rotating liquid, heated from below, stability 3=16591
- solar chromosphere, rel. to mag. field 3=9209
- solar H zone, unstable modes 3=13882
- thermal, associated damped waves 3=24084
- thermal, eqns. for thin fluid layer 3=24085
- thermal leading edges on vertical walls 3=278
- turbulent, at arbitrary Prandtl number 3=1853
- turbulent, mixing-length theory 3=21590
- CO₂, near critical pt., laminar free convection 3=21589
- H₂, liquid, thermal exchange coeffs. 3=16605

Cooling

- See also Joule-Thomson effect; Low temperature production; Supercooling.
- cooler based on Ettinghausen longit. effect, theory 3=14408
- ettingshausen, in pyrolytic graphite 3=15530
- heat transfer bibliography 3=7364
- rapid, thermo-couple solders on quenching in water 3=7371
- semiconductors, many-valley, elastocaloric effect 3=4832
- thermoelectric, material charac. and appl. 3=19167
- thermoelectric, minority-carrier theory 3=15638
- transpiration, in magnetohydrodynamic stagnation-point flow 3=273
- Ge, elastocaloric effect, calc. 3=4832

Copper

- abrasion by carbon brushes 3=20761
- adsorption of CO 3=11322
- atom, μ -mesonic, X-ray transition energies 3=6370
- atoms and ions, self-consist. field calcs. 3=22476
- atoms, electron radial distrib. 3=19934
- atoms, mesic, μ decay anomaly 3=15312
- Bordoni peaks, rel. to deformation and annealing 3=23298
- cathode sputtering, particle vel. meas., rel. to focusing energies 3=25315
- chemoemission, rel. to oxidation and reduction up to 600°C 3=2012
- cold deformed, lattice distortion: relaxation curves, X-ray reflections 3=3288
- cold-worked, stored energy release on annealing 3=11173
- coldworking, effect on hardness and conductivity, electrical 3=13373
- conductivity, electrical, wire, recovery after cold rolling at 78°K 3=20266
- cross-slip and stacking-fault energy 3=1230
- crystal dislocations, rolled, electron microscope exam. 3=15493
- crystal di-vacancies, migration and binding energy 3=20164
- crystal growth, dumbbell-shaped, preselected orientation 3=23391
- crystal lattice dilation, hard-drawn fine wires 3=18212
- crystal spheres, Kikuchi reflection diagrams 3=1292-3
- crystal whiskers, mechanical strength, tensile, increase on alloying with Ag 3=20727
- crystalline spheres, cathode sputtering by Kr, from 1 to 10 keV 3=2051
- crystals, irradiation, hardening 0°C, recovery 3=20721
- damage by electron-irrad., low-temp 3=22860

Copper — contd

Debye-Waller factor, 4° to 500°K 3=20082
 defect clusters, rel. to fission fragment irradi. 3=17803
 deformed by filing, stacking faults, by X-ray diffr. broadening 3=20208
 diffusion study by impurity thermionic emission 3=4203
 diffusion of Au, grain boundary, meas. 3=2824
 diffusion of Tl, 785°-996°C 3=22826
 diffusion in Au crystals in boiling HCl 3=4888
 diffusion in NaCl, effect of dislocations 3=15513
 diffusion in Ni in Cu-Ni powder compact 3=2823
 diffusion in Zn⁶⁶, small penetration 3=13001
 diffusion of Z, saddle-point config. model 3=2789
 dislocation array after plastic deform. 3=15496
 dislocation config. after high-temp. creep 3=12978
 dislocations from cyclic deformation 3=12984
 dislocation density and plastic flow 3=794
 dislocation dipoles, tangles and loops 3=17732
 dislocations, films, changes, by electron microscopy 3=15494
 dislocation loops rel. to stress-strain relns. 3=2805
 dislocation loops 3=17750
 dislocation loops, prismatic, stress-prod. 3=10671
 dislocation prod. by low-energy ions 3=17723
 dislocation relax. after 4·2°K plastic deform. 3=8757
 dislocation relaxation peaks 3=25613
 dislocations due to bending, etch pit study 3=2808
 dislocations, etch-pit studies, rel. to annealing and irradiation 3=22788
 dislocations, etching reagents for obs. 3=8438
 dislocations rel. to chemical etch pits 3=2807
 divacancy migration, recovery from radiation effects 3=22751
 edge dislocations, elec. resist., theory 3=2801
 elastic consts. calc. from lattice vibrations 3=18158
 elastic modulus and damping, effect of neutrons 3=5059
 elastic modulus and dislocation pinning, rel. to electron irradi. 3=796
 electrocrystallization, substrate imperfections 3=23415
 electrode potential, single crystals, in H₂O, NaCl solns., effect of illum. 3=18451
 electrodes, surface materials torn out in vacuo 3=12236
 electrolytic deposition for targets and radioactive sources 3=24532
 electron emission by Ar⁺ ions at 1-10 keV 3=9844
 electron emission by H⁺ ions at 1-30 keV 3=24347
 electron emission due to rare gas ion effects 3=9843
 electron emission, secondary, 20°-450°C 3=427
 electron emission in vacuo 3=5690
 electron irradi., damage, rel. to energy 3=8468
 electron microcharacteristics meas., by optical constants 3=15467
 electron relaxation time anisotropy 3=8383
 "electron wind" effect 3=22829
 electrotransport mobility of Sn impurities 3=8433
 energy band structure, calc. 3=4840
 epitaxial film, similarity with Ag, Au 3=23506
 epitaxial growth on W field emitters 3=25681
 etching of annealing-twin boundaries 3=18029
 fatigue cycling, torsional, metallography 3=20747
 fatigue failure under cyclic stress 3=1245
 fatigue and impact fractures 3=3244
 fatigue investigation 3=18213
 fatigue, small amplitudes, altern. torsion 3=13337
 fatigued, dislocation distrib. rel. to props. 3=20739
 Fermi surface, dimensions 3=6495
 Fermi surface, effect of pressure 3=8398
 films, absorption, light, oxidation and wavelength effects 3=17991
 film on Ag, Pd, Ni, structure 3=1371
 films, characteristic electron-energy losses 3=5712
 films, crystal structure, polygonal, formation, by electron microscopy 3=15494
 films, grain structure and distortions 3=2817
 films, granular, electrical properties and flicker effect 3=15540
 films, neutron irradi. effects 3=22869
 films, optical consts. rel. to wavelength 3=10902
 films, optical density meas. 3=20934
 films, reflection and transmission, light, 4-20 μ m, anomaly 3=17996

Copper — contd

films, sorption of H, CO, surface potential, diode meas. 3=13602
 films, stresses 3=11145
 films, 35-50 μ , strength, tensile, 100-300°C 3=6783
 focusing collision chains, assisted 3=22884
 foils, from rolled Cu, prep. and tensile testing 3=5073
 Frenkel pair formation by electrons, theory 3=20250
 friction on electrographite, surface and crystal-structure changes 3=6807
 glide dislocations, rel. to irradi.-produced prismatic dislocations 3=17760
 grain boundary diffusion of Ag in bicrystals 3=6533
 Grüneisen γ , temp. depend. calc. 3=10607
 hardening by neutron irradi., low-temp. 3=23340
 hardening, recognition criteria, temp. depend. 3=3230
 hardness relax. after cold deformation 3=11187
 helicon oscillations det. 3=10728
 impurity ions in Cu, scattering cross-sections and charges 3=17813
 impurity specific heat 3=22700
 internal friction 3=25612
 internal friction, electron irradi. effects 3=18169
 internal friction of electron irradi. metal, rel. to defects 3=1218
 internal friction peaks at low temps. 3=11136
 internal friction, rel. to electron irradiation 3=8758
 interstitial configurations, rel. to deuteron irradi. 3=22755
 ion emission, secondary, on inert gas ion bombardment, 100-30000 eV 3=14665
 ionization energy meas. 3=2906
 ions, Cu²⁺, in octahedral complexes, spin inversion and e.s.r. 3=25570
 Kapitza resistance meas. 3=12017
 lattice defects, study of quenching 3=15481
 lattice dynamics by axially symm. model 3=2711
 lattice dynamics, [110] direction rel. to cohesion theory 3=2706
 layers, electrolytically-deposited, orientation and morphology 3=18234
 liquid, surface tension, optical meas. 3=16598
 loop size distrib. after neutron irradi. 3=17722
 loops and black spots, rel. to α -irradi., 1.5 MeV 3=17770
 magnetoacoustic effect to 350 Mc/s, Fermi surface dimensions 3=2759
 magnetoplasma resonance, l.f., meas. 3=8409
 magnetoresistance and Fermi surface 3=35329
 mechanical props. of single crystals rel. to neutron irradi. 3=8467
 mechanical strength, tensile, work hardening, foils 3=23353
 mechanical strength, torsion, and tensile strength-endurance relation 3=18208
 neutron damage, effect of plastic deformation, 1.8° 3=6554
 neutron damage for fast flux 3=2847
 neutron irradi., flow stress 3=20719
 n.m.r. 3=21997
 n.q.r. of Cu nuclei near impurities 3=13318
 (100) faces, bombard. by Ar⁺, Ne⁺ 3=13020
 optical constants and electron theory 3=2986
 optical consts., polarimetric method 3=11943
 oxidation, electron-diffraction study 3=13417
 oxidation electron microscope obs. 3=18435
 Peltier coeff., meas., phonon drag 3=20425
 photoelec. emission in K-absorpt. edge region 3=6351
 photoelectric emission, X-rays, 0.7-30 keV 3=14638
 photovoltaic emission into CdS 3=23013
 plastic deform., lattice defect conc. increase 3=11154
 plastic deform. of polycryst., surface obs. 3=18199
 plastic deformation, formation of point defects 3=22711
 plastic deformation, various rates, and temps., recovery of induced thermal force 3=8777
 plastically deformed, stored energy meas. 3=15988
 point defect formation, disloc, uncertainty 3=12960
 point defects in irradiated metal, review 3=8420
 point defects, rel. to electron irradi. 3=22726
 polygonization, rel. to impurities 3=20897
 porous, dynamic compression 3=6787
 powders, C-reduced, density, flow rate 3=13552

Copper — contd

- pressure-bonded, interfacial voids 3=16114
- primary atom energy distributions, rel. to fast neutron irradi. 3=8431
- quench hardening and resoftening 3=8907
- radiation damage by neutrons, from electron microscope examination 3=8939
- recrystallization, effect of pressure on pure Cu 3=6866
- resistance, electrical, strip cold rolled from powder, along and across rolling direction 3=22900
- secondary electron emission, 1 MeV proton bombardment 3=24344
- shear modulus, rel. to stationary extended dislocations 3=25616
- shear stress, critical, of single crystals 3=1238
- shear stress under pressure 3=13354
- shock compression up to 9×10^8 atm 3=6786
- shock waves, oblique collision; irregular conditions 3=1756
- shocked, residual temps. 3=21597
- sintering, void shrinkage meas. 3=13537
- slip bands, persistent, near grain, twin boundaries 3=2809
- solid solns. of Zn, Ga and Ge, heats of formation 3=6872
- spectra, in low-temp. flame, using new spark source 3=11923
- sputtering, angular dependence for single crystals 3=10705
- sputtering by Ar⁺-ion bombardment, 25-75 keV, focused recoil trajectories 3=2049
- sputtering, by H ions 3=4218
- sputtering on metals, hollow-cathode Ar discharge 3=16988
- sputtering by Ne⁺, Ar⁺, Cu⁺ ions, 5-20 keV 3=4217
- sputtering, by Ne⁺, Ar⁺, Kr⁺, Xe⁺ ions, 100-1000 eV 3=4216
- stacking fault energy calc. 3=10656
- stacking faults in thin single crystals 3=10681
- structure, effect of low-temp. deformation and annealing 3=20945
- sound velocity, effect of high mag. field 3=8386
- specific heat calc. 3=6476
- sputtering by Ar⁺ ions, 10-200 keV 3=7655
- sputtering by Ar⁺, 1-2 MeV, preferential ejection 3=7656
- sputtering, using 1-5 keV Ar⁺ ions 3=9877
- stacking-fault electron scattering 3=22795
- strain hardening, temp. depend. 3=18201
- stress-strain props., vacancy cluster effects 3=25618
- superconductive thermal boundary resistance, with Sn and Pb 3=19108
- surface diffusion, rel. to irradi. 3=8457
- surface oxidation, dislocations, effect 3=16130
- thermal conductivity, phonon and electron components separation methods 3=12930
- thermal expansion, 20°-1200°K 3=17663
- thin films, optical constants, rel. to heat treatment 3=13146
- thin foils, X-ray spectra fine structure "melting" 3=10973
- temp. change at boundary with superfluid He 3=5570
- trace analysis in ZnS by neutron activation 3=11371
- transport, in arcs, electric, compared with Na 3=24256
- in II-VI and III-V semiconductors, as impurities, excited states 3=10810
- vacancies, equil. concns. meas. 3=8428
- vacancies, properties 3=22738
- vacancy clustering in dislocations, internal friction meas. 3=23289
- vacancy clusters 3=17707
- vacuum condensates, structure, strength 3=1366
- vaporization, heat of, at 298°K 3=1876
- vapour plasma wrapped with N or Ar, contraction and emission 3=7557
- vibr. spectrum by Dayal's method 3=2713
- whiskers, growth and strength, impurity effects 3=20726
- whiskers growth by vapour reduction 3=18277
- whiskers, tensile rupture tests 3=6801
- work hardening of foil crystals 3=23344
- work hardening, shear, 4.2-500°K 3=20725
- work hardening under cyclic straining 3=20737
- X-ray absorption, CuK $\beta_{2,3}$ emission 3=25474
- X-ray anomalous transmission 3=20828
- X-ray emission spectra, M-series 3=23088

Copper — contd

- X-ray M-bands from Cu-Ni system 3=23087
- X-ray scatt., low angle 3=2072
- Cu, dislocations X-ray diffr. study 3=6523
- Cu (100) surface, sputtering by Ar⁺ ions 3=10703
- Cu, single crystal, (100) and (111) faces, sputtering anisotropy 3=15522
- Cu, vibr. spectrum by Dayal's method 3=2713
- Cu²⁺, line broadening of P³¹ n.m.r. absorpt. in H₃PO₄ 3=13316
- Cu²⁺, mag. anisotropy, susceptibility 3=13224
- Cu³⁺ in corundum, meas. 3=13300
- Cu I spectral line intensities and gf values 3=6352
- Cu-Pb-Cu sandwiches, thermal cond. at liq. He temp. 3=24150
- H₂ diffusion and solubility 3=20220
- Kr particle range, 10-150 keV, high values perpendicular to (110), due to focussing 3=20251
- X-radiation at 30 kV, ratio of K α to white 3=25473
- X-ray K α_1 line shift from Cu to CuO 3=20499
- Copper compounds**
- alloys, containing Bi brittle phase, dihedral angle 3=13499
- alloys stacking-fault electron scattering 3=22795
- alloys, stacking-fault energies, rel. to solute atoms 3=22796
- α -brass, boundary and stacking-fault fringes, anomalies 3=2812
- α -brass, dislocation arrangements obs. 3=17738
- α -brass films, etching by ion bombardment 3=18241
- α -brass, lattice parameters, from powder diffraction photographs 3=25738
- α -brass, orientation rel. to slip plane dislocation array 3=3257
- brass, α -, shear, microscopic strain distrib. 3=6799
- α -brass, stress-corrosion process 3=11190
- α -brasses, embrittlement process by liq. Hg 3=13378
- β brass (45%Zn), α phase precipitation at 460°C 3=13534-5
- β -brass, Cu^{63,65} n.m.r. lines 3=6765
- β -brass, elec. resistivity, rel. to quenching 3=20268
- β -brass, metastable, precipitation due to fatigue 3=1359
- β -brass moving edge dislocations 3=10654
- β -brass, ordering energy 3=8899
- brass, elastic const. meas. 3=9527
- brass, fatigue at small amplitudes 3=13337
- brass, lead, low-temp. resist. thermometers 3=14430
- brass, paramagnetic susceptibility, rel. to impurities 3=18061
- brass, roughness, meas. by adsorption of I¹³¹ 3=13556
- bronze, photoelec. yield, 3000-250 Å 3=21865
- bronze, shear stress under pressure 3=13354
- constantan, heat capacity, 0.15°-4.2°K 3=20107
- Cunifo I, precipitation-hardened, microstructure 3=20895
- Cunife, anhysteretic suscept. 3=1144
- Cunife I, precipitation-hardened, microstructure 3=20895
- cuprite, green and yellow series as exciton spectra 3=25455
- cuprous chloride spinel, formation & structr. 3=1326
- dipyrrromethane, spin-lattice relax. 1.4-4.2°K, and phonon heating 3=8725
- formates, hydrated, low temp. mag. props. 3=18056
- Heusler alloys, mag. props. and crystal structure 3=15778
- manganin, heat capacity, 0.2°-4.2°K 3=20107
- oxide whiskers, surface population det. by electron microscopy 3=13581
- phthalocyanine, crystals, resistance, effect of halogens 3=6593
- rare earth-Cu₂, crystal structure, atomic 3=20874
- X-ray absorption, CuK $\beta_{2,3}$ emission 3=25474
- X-ray K α , line shift from Cu to CuO 3=20499
- Cu₂[A^{IV}B₃]ⁿ type, semiconducting materials, crystal structure 3=13513
- Cu(II) complexes, mag. moments calc. 3=22560
- Cu acetate monohydrate, isotropic exchange integral 3=15730
- Cu alloys damage by electron-irrad., low-temp. 3=22880
- Cu alloys, dilute, lattice conduct. meas. 3=15450
- Cu alloys, thermoelec. power, effect of transition metals 3=13139
- Cu oxide whisker growth 3=18280

Copper compounds — contd

- Cu—Ag, elastic consts from u.s. velo., wedge method 3=23276
 Cu—Ag, vibr. entropies of Ag, eval. 3=12922
 Cu—Al alloy, α -phase, enhanced diffusion, rel. to neutron irradi. 3=10702
 Cu—Al alloy fission fragment damage 3=22855
 Cu—Al alloys, dislocation distrib. and densities 3=17753
 Cu—Al alloys, f.c.c., deformation twinning 3=17766
 Cu—Al alloys, f.c.c., stacking faults 3=8442
 Cu—Al, β' martensite, crystal structure 3=18335
 Cu—Al, constitution, effect of quenching 3=20868
 Cu—Al, crystal structure of β' martensite 3=25736
 Cu^{Al}, dislocations from cyclic deformation 3=12984
 Cu—Al, elastic limit anisotropy 3=11143
 Cu—Al martensites, microstruct. and crystal struct. 3=20869
 Cu—Al, near solubility boundary, ordering 3=5132
 Cu—Al, ordering, rel. to quenching temp. 3=18349
 CuAl₂, plastic deformation, up to m.p. 3=20718
 α Cu—Al, primary and cross-slip lines 3=15999
 σ Cu—Al single crystals, microstraining 3=20706
 Cu—14% at Al, slip, cross, during easy glide, single crystals, no temp. var. 3=23337
 Cu—Al, strengthening 3=23348
 CuAl₂—Al eutectic alloys, solidification 3=11283
 Cu—Au alloys, ordering, rel. to mechanical props. 3=20685
 Cu—Au, elastic consts., from u.s. velo., wedge method 3=23276
 CuAu, Cu₃Au, electron pair annihilation radiation ang. distrib. 3=17694
 CuAu, order and disorder-antiphase transitions 3=8887
 CuAu, structure, above order-disorder transition temp. 3=3321
 CuAu II, nucleation, growth from disordered state 3=8902
 CuAu II, structure 3=8880
 CuAu II, superlattice, long-period 3=1358
 Cu₃Au, antiphase boundaries 3=18334
 Cu₃Au, Hall effect, influence of ordering 3=839
 Cu₃Au, kinetics of ordering 3=20889
 Cu₃Au, ordering kinetics, X-ray obs. 3=13529
 Cu₃Au, ordering meas. from thermolec. data 3=25753
 Cu₃Au, ordering process from elec. data 3=3330
 Cu₃Au, ordering process, Hall effect data 3=3331
 Cu₃Au, plastic deformation, yield point, for interrupted deform., var. with ordering, strain 3=25623
 Cu₃Au, short-range order parameters 3=23465
 Cu₃Au superlattice, off-stoichiom., electron micr. study 3=13495
 Cu₃Au, superlattice structure 3=1356
 Cu₃Au, thermo-e.m.f. calc. 3=4957
 Cu₃Au, yield stress rel. to antiphase domain size 3=16001
 Cu₃Au II, existence confirmation, using thin films 3=13532
 Cu-base alloys, diffusion-controlled reactions, rel. to irradiation 3=11291
 Cu-base, in arcs, electric, from electrodes 3=24255
 Cu-base solid soln., local atomic displacements 3=3341
 Cu₂B₁₀H₁₀, crystal structure 3=3303
 Cu—Be, aged, orientations of new phases 3=16099
 Cu—Be alloy, deformation of age hardened crystals 3=23315
 Cu—Be alloy, GP zone elastic lattice distortion 3=1314
 Cu—(2%)Be alloy, GP zone structure 3=13493
 Cu—Be alloys, structural hardening 3=1349
 Cu—Be dynode photo-multiplier 3=12264
 Cu—Bi alloys, internal oxide platelet 3=18221
 CuBr, aerosols, phase changes 3=1402
 CuBr, exciton, absorpt. and refl. spectra 3=4975
 CuBr, luminescence, narrow bands 3=3040
 Cu_{0.9}Cd_{0.1} ferrite, magnetization increase, 110–200 kOe 3=20617
 CuCd₃, X-ray study of ϵ -phase 3=25735
 CuCl absorpt. and refl. spectra 3=15678
 CuCl, exciton, absorpt. and refl. spectra 3=4975
 CuCl, exciton spectra at 4.2°K 3=2765
 CuCl, exciton spectrum, elec. field effects 3=8405
 CuCl, new absorption spectrum lines 3=25456
 CuCl₂, antiferromag. ordering and entropy changes 3=1061

Copper compounds — contd

- CuCl₂·2H₂O, Cl n.m.r., 1.3–4.24°K 3=20680
 CuCl₂·2H₂O, antiferromag. props. 3=18108
 CuCl₂·2H₂O, antiferromag. resonance at liq. He temp. 3=15929
 [Cu(CN)₄]²⁻ ions, energy levels, absorpt. spectrum, polarizations, calc. 3=19992
 Cu—Co alloy, coherency strains around precipitates 3=1222
 Cu—3%Co alloy, precipitation hardening 3=20898
 Cu—Co alloys, ferromag., magnetization-blocking process by volume development 3=1096
 Cu—Co alloys, structure 3=8635
 Cu—Co, dilute, mag. props. down to 0.08°K 3=3132
 Cu—Co, magnetic annealing 3=13232
 Cu—(2 wt.%)Co precipitation rel. to dislocations 3=20894
 Cu—2.4% Co small particles, electron microscope exam. 3=1090
 Cu—Cr (0.3%) high-strength alloy, transverse magneto-resistance 3=20274
 CuF₂·5HF·5H₂O, e.s.r. at 9625 Mc/s 3=5038
 CuF₂·2H₂O, antiferromag. props. 3=18108
 Cu—Fe mixed whiskers, metallography 3=20796
 Cu—Fe, precipitation, rel. to Mössbauer effect 3=22698
 CuFe₂O₄, cubic-tetragonal phase transform. 3=11205
 CuFeS₂ mag. & elec. props. 3=1027
 CuFeS₂, polymorphic transition and mag. props. 3=11049
 Cu—Ga, type of stacking faults 3=12993
 Cu—Ge alloys, stacking faults 3=22797
 Cu—Ge, stacking fault energy 3=12986
 Cu—Ge—Si, stacking fault energy 3=12986
 Cu halides, exciton spectra, low-temp. 3=10934
 Cu(HC₂O₂)₂·4H₂O, mag. props. 3=15780
 γ -CuI, crystal structure 3=20835
 CuI, exciton, absorpt. and refl. spectra 3=4975
 CuI, exciton spectra at 4.2°K 3=2765
 CuI films, exciton absorpt. bands, 82°K 3=20473
 CuI, oxygen-controlled elec. conduct 3=13071
 CuIO₂(OH), salesite, crystal structure 3=1338
 CuInSe₂ semiconductor, prep. and props. 3=864
 CuInTe₂ semiconductor, prep. and props. 3=864
 Cu—K sulphate, spin system, thermodynamic properties 3=20109
 Cu—Mn alloys, superparamagnetic properties 3=25506
 Cu—Mn, ferromag.—antiferromag. model 3=20585
 Cu—(22.8%)Mn, magnetization and magnetocaloric effect 3=8694
 Cu—(22.8 at.%)Mn, magnetoresistance, 15 kOe, rel. to temp. 3=13031
 Cu—Mn—Al, κ -phase, neutron diffrn. study 3=11093
 CuMn₂O₄, magnetic distortion, lack of 3=1009
 CuMn₂O₄, cation disposition, inversion 3=20846
 Cu—Mo electrodeposits, intergranular brittleness 3=3237
 Cu(NH₃)₄SO₄, mag. susceptibility and spec. ht. at low temp. 3=1060
 Cu_{0.85}NbS₂, crystal structure, atomic comparison with NbS₂ and MoS₂ 3=16078
 Cu—Ni alloys, creep and lifetime under load, 700–1150°C 3=15996
 Cu—Ni alloys, diffusion coeff., rel. to composition 3=6532
 Cu—Ni alloys, f.c.c., stacking faults 3=8442
 Cu—Ni alloys, n.m.r., 14°K 3=15950
 Cu—Ni alloys, spectrochemical analysis, Fe impurity intensity. 3=25840
 Cu—Ni, crystallization of supercooled alloy system 3=21624
 Cu—Ni, elastic consts., from u.s. velo., wedge method 3=23276
 Cu—Ni films, submicroporosity, effect of annealing and loading 3=23510
 Cu—Ni oxide films, morphology 3=18432
 Cu—Ni, paramag. rel. to short-range order 3=3085
 Cu—Ni system, X-ray M-bands of Cu and Ni 3=23087
 Cu—Ni wires, resistivity, rel. to neutron-irradiation 3=10719
 CuNi, work function meas. using GM counter 3=2015
 Cu₂O, absorption spectra, low-temp. photometric study 3=4972
 Cu₂O, absorption spectrum 3=10936
 Cu₂O crystal dislocations, etch pit obs. 3=22789
 Cu₂O crystal excitons, spectra 3=22689

Copper compounds — contd

- Cu₂O, crystal excitons, Zeeman effect, polarization, up to 140 kOe 3=18002
- Cu₂O, defect structure 3=22735
- Cu₂O, energy band structure, rel. to exciton reflection spectrum 3=15650
- Cu₂O, exciton absorption spectrum, effect of deformation 3=3005
- Cu₂O, exciton scattering 3=17690
- Cu₂O, exciton spectra, class 1 and 2, low-temp. quantitative 3=10935
- Cu₂O, exciton spectra, theory 3=3004
- Cu₂O, excitons, in external fields 3=10631
- Cu₂O, films, absorpt., light, and exciton formation 3=13170
- Cu₂O, films, deposition by sputtering of Cu in A and O 3=16138
- Cu₂O, films, sputtered, growth structure, by electron diffr. 3=16139
- Cu₂O, long wave modes, symm. coords. 3=2720
- Cu₂O, luminescence and elec. cond., elec. field effect 3=22942
- Cu₂O, luminescence, i.r., quenching by water and solutions 3=18028
- Cu₂O, luminescence and photocond., effect of O vacancies 3=18029
- Cu₂O, luminescence, short-wavelength bands, relaxation time 3=3041
- Cu₂O, neg. photocond. in long-wave region 3=2971
- Cu₂O, nuclear quadrupole relaxation and its temp. dependence 3=25598
- Cu₂O, photoconductivity 3=20402
- Cu₂O, photoconductivity, activation energies 3=4954
- Cu₂O, photoconductivity relaxation time, temp. var., energy structure 3=20403
- Cu₂O, photovoltaic e.m.f., variation with temp. 3=6630
- Cu₂O, rectifiers, turnover phenomena 3=6607
- Cu₂O, thermoelec. props., 500-1130°C 3=25428
- Cu₂O, u.v. absorpt. spectrum, var. with temp. 3=10990
- Cu₂O, yellow exciton series, effect of Ag impurities 3=932
- Cu₂O, yellow exciton spectra, rel. to neutron-irradiation 3=17998
- Cu₂O, yellow series, n = 1 line, oscillator strength 3=23068
- CuO, absorption spectrum, effect of stress 3=4971
- CuO, Cu₂O, film growth on Cu, in O₂, mechanism 3=23516
- CuO, crystal and magnetic structures by neutron diffraction 3=126
- CuO-Fe₂O₃, ferrimag. props. 3=18104
- CuO ultra fine particles, antiferromag., susceptibility meas. 3=1095
- (CuO)_x(Mn₂O₃)_{1-x}, electrical props. and crystal structure 3=8251
- Cu phthalocyanine, Hall effect and carrier mobility 3=2911
- Cu₃(PO₄)₂(OH)₄, pseudomalachite, crystal structure 3=3307
- Cu-Pb, elastic consts., from u.s. velo., wedge method 3=23276
- Cu-(10-20 wt.%)Pd alloys, order-disorder structure 3=20870
- CuPt, thermo-e.m.f. calc. 3=4957
- Cu-Pt solid solution thin foils, X-ray spectra fine structure "melting" 3=10973
- Cu(II) pyridine complexes, i.r. spectrum of thiocyanate group 3=22581
- Cu salicylate, crystal modifications, mag. different 3=23374
- Cu₂S, crystal structure 3=23448
- Cu₂S hole injection into CdS 3=25382
- Cu-Sb alloy, dislocations, rel. to yield behaviour 3=6870
- Cu-Sb, interfacial free energy 3=18096
- Cu-Sb, de Haas-van Alphen effect 3=12944
- Cu-Se, heated to 600°C, electron diffrn. study 3=25788
- Cu-Si alloys, α → κ phase transf., role of vacancies 3=1353
- Cu-Si alloys, deformed, atomic rearrangements 3=22701
- Cu-Si alloys, spherical oxide particles 3=18221
- Cu-10% Si, f.c.c., filings, heavy deform. faulting, by X-ray diffr. 3=8418
- Cu-Si, stacking fault energy 3=12986
- Cu-Si-Mn alloys, deformed, atomic rearrangements 3=22701
- Cu-Sn α solid soln., strain ageing 3=23346

Copper compounds — contd

- CuSO₄, electromagnetophoresis 3=16901
 - CuSO₄·H₂O, crystal structure 3=18327
 - CuSO₄·5H₂O, e.s.r., amalgamation 3=20640
 - CuSO₄·5H₂O, paramag, ions coexisting within ordered spin system 3=20644
 - Cu₃(SO₄)(OH)₄, antlerite 3=8866
 - CuTe, molecular emission spectrum 3=12819
 - Cu-Ti alloy, phase transformations rel. to plastic deformation 3=5126
 - Cu-TiX, CsCl-type structure 3=1344
 - Cu-Zn, α-phase, resistivities, thermopowers, 4.2°-300°K 3=20267
 - Cu-Zn alloy, α-phase, enhanced diffusion, rel. to neutron irradiation 3=10702
 - Cu-Zn alloy, electron emission charac. in gases 3=418
 - β-CuZn alloy, 4.2-800°K 3=8752
 - Cu-Zn alloys, corrosion, by NH₃-containing atmosphere 3=8953
 - Cu-Zn alloys, cross-slip and stacking-fault energy 3=1230
 - Cu-Zn cpds, X-ray K absorption edge fine structure in β, γ, ε phases 3=5134
 - α-Cu-Zn, density of states at Fermi surface 3=17660
 - Cu-Zn, ε and η phases, lattice spacings 3=6856
 - Cu-Zn, fatigue, S-N diagrams meas. at 100°K 3=20750
 - Cu-Zn, f.c.c., torsion, diffusion rates 3=12999
 - β-CuZn, short range order study 3=18105
 - β-CuZn, specific heat, below 4.2°K 3=766
 - Cu with Zn, spectrochemical analysis, in discharge, effect of Si, Na, time var. 3=25845
 - Cu-Zn, strengthening 3=23348
 - Cu-Zn, X-ray emission spectra, M-series 3=23088
 - Cu-Zn-Cd, phase diagram, section 500°C, 100-35% Cu 3=8898
 - Cu-Zn-Sb, structure, elec., mechanical props. 3=23466
 - Cu-Zr (0.12%) high-strength alloy, transverse magnetoresistance 3=20274
 - Cu₂ZrAl, Cs Cl-type structure 3=1344
 - CuZrZn, Cs Cl-type structure 3=1344
- Coriolis forces**
See Dynamics.
- Corona, electric discharge**
See also Breakdown, electric.
- air, rel. to Ar, CO₂, N, discharges 3=4046
 - cathodic erosion at negative point 3=4052
 - dielectric containing gas-filled voids, theory 3=7472
 - h.f., temp. meas. in transition region 3=1947
 - impulse growth times, disagreement resolution 3=21744
 - impulse, rel. to long sparks 3=24246
 - noise pulses meas. in SCl tubes 3=21745
 - positive channel growth in non-uniform fields during breakdown 3=19206
 - in solid dielectrics, analysis 3=4104
 - stabilizer tube, with regulated voltage 3=9747
 - as voltage stabilizer, in air, between wire and plate 3=5640
 - H₂, positive burst pulse corona, ionizing radiations produced 3=24247
- Corona, solar**
See Sun, corona.
- Corrosion**
- α-brass, stressed, rel. to surface tarnish 3=11190
 - crystal structure effect 3=6919
 - electron microprobe examin. 3=3377
 - by ferroelectric domain boundaries, triglycine sulphate 3=8563
 - metal surfaces, nearly perfect, meas. methods 3=23500
 - metals, conference, London (1961) 3=6917
 - metals, protective methods 3=6920
 - reactor metals, aqueous, review 3=695
 - steel, austenitic, stainless, stabilized with Ti, welds, 1000°-1300°C 3=3337
 - Al, anodic oxide layers 3=6918
 - Au and Ag films on water, rel. to orientation 3=25774
 - Cu-Zn alloys, by NH₃-containing atmosphere 3=8953
 - Fe-Ni alloys, surface layers, formation and structure 3=20913
 - Ge, and diffusion profile in etching, meas., n-type 3=20228
 - In-Pb alloys, surface layers, formation and structure 3=20913

Cosmic radiations, radiofrequency

- See also Radioastronomy; Sun, radiation, r.f.
 absorption, in atmosphere 3=7723
 angular size of sources, analysis 3=9279
 angular structure study from lunar diff. 3=3613
 astronomical satellite scintillations, rel. to geomagnetic field 3=21077
 catalogue of sources, 3C, revised 3=13926
 catalogue, 3C, revision 3=9280
 Centaurus A, Faraday rotation 3=11604
 Centaurus A, Faraday rotation effects 3=5281
 Centaurus A, 9.1 cm obs. 3=9278
 comet Wilson 1961 d, decametric radiation 3=5277
 Crab Nebula occultation by solar corona, June 1962 3=13936
 Crab nebula, polarized and non-polarized emission 3=11606
 Crab nebulae, flux density at 3.2 cm 3=11607
 Cyg A, Tau A, Orion, Omega and galactic nucleus 3=13933
 Cygnus loop, 38 Mc/s meas. 3=21134
 Cygnus radio-star, use for ionospheric studies 3=13712
 extragalactic sources, density and intensity 3=16432
 extragalactic sources, 24, brightnesses 3=13935
 extra-galactic sources, polarization meas. 3 to 75cm 3=13934
 galactic emission, polarized, Faraday rotation 3=5280
 galactic and extragalactic origins 3=11587
 galactic 408 Mc/s emission linearly polarized component 3=1542
 Galactic, 4.7 Mc/s 3=9283
 galactic halos as transient phenomena 3=23710
 galactic nucleus, origin of emission 3=5279
 Galactic plane sources, catalogue 3=13929
 galactic radiation at 38 Mc/s, survey 3=21133
 Galactic radiation 3=11601
 galactic survey at 178 Mc/s 3=7050
 galactic 21cm line, Zeeman splitting, measurement attempt 3=13927
 galaxies, "absolute radio magnitude" 3=5278
 galaxies (class-II sources), review 3=18662
 galaxies, normal, southern, at 1410 and 408 Mc/s 3=25986
 galaxies of normal or low emissivity at 1430 Mc/s 3=25987
 Galaxy, disk component 3=16429
 Galaxy, mag. field meas. 3=9282
 Galaxy, polarization and Faraday rotation effects 3=25985
 Galaxy, southern, 1440 Mc/s survey 3=3624-5
 galaxy sources, polarization, 3 cm, search 3=18663
 Galaxy, 21 cm, H distrib. deviation from galactic plane 3=23712
 Galaxy, 21 cm, rel. to gas disk thickness 3=13915
 HB 21 radio source, structure 3=9275
 Hercules A, 958 Mc/s, structure 3=5284
 interferometer meas., 1427 Mc/s for 8 sources 3=3626
 ionospheric absorption of noise, rel. to chorus 3=23618
 Jovian decametric bursts, long baseline interferometry 3=13923
 Jupiter, cyclotron radiation theory 3=3621
 Jupiter, decametre radiation 3=11593
 Jupiter, decametre radiation, polarization 3=25980
 Jupiter, decametre radio storms, theory 3=21132
 Jupiter, decametric bursts, polarization 3=25982
 Jupiter, decametric emissions, mag. field configuration 3=25981
 Jupiter, decametric, synoptic obs. 1957-61 3=13922
 Jupiter, decimeter radiation meas. 3=7048
 Jupiter, decimeter-wave emission, variations 3=7047
 Jupiter, l.f. emission, dynamic spectra 3=9268
 Jupiter, 8 mm 3=5273
 Jupiter, at 13 and 21 cm, brightness temp. 3=25983
 Jupiter, 5-38 Mc/s 3=25979
 Jupiter, 18 and 22 Mc/s emission 3=9270
 Jupiter 18Mc/s burst rel. to spin-flip transitions 3=7046
 Jupiter, 38 Mc/s 3=9269
 Mars, 26.3 Mc/s 3=5272
 Mercury, microwave emission 3=3623
 Mercury, 26.3 Mc/s 3=5272
 moon, brightness distrib. at 0.8 cm 3=9266
 moon, thermal cond. det. 3=11512
 moon, 3.2 cm, polarization 3=9265
 moon at 3.2 cm, radiation props. 3=9264

Cosmic radiations, radiofrequency — contd

- nebulae, Crab, 21 cm, polarization 3=23713
 nebular sources, polarization, 3 cm, search 3=18663
 NGC 5128 and 1316, 4.7 Mc/s 3=9283
 noise absorption, F2 component 3=25988
 noise absorption rel. to magnetic SSC 3=9135
 noise, 25 Mc/s, rel. to F-scatter 3=5861
 non-thermal sources, spectra rel. to brightness temp. 3=1541
 North Polar region survey at 178 Mc/s 3=9276
 Omega nebula, 9.1 cm obs. 3=9278
 optical objects in fields of 42 sources 3=23711
 Orion nebulae, flux density at 3.2 cm 3=11607
 Orion nebula, 9.1 cm obs. 3=9278
 Perseus cluster, 1430 Mc/s 3=16431
 planets, origins 3=23708
 polar cap absorption events, day-to-night ratio 3=18661
 polarized galactic radiation, determ. of ionosphere electron content 3=6980
 radio-galaxies, review 3=1543
 radio star fadeouts on phase-switching interferometer records 3=11602
 radio star scintillations rel. to auroral and magnetic activity 3=11603
 radiostars, scintillations, variation with zenith angle 3=21124
 Sagittarius A, 9.1 cm obs. 3=9278
 Sgr A at 21cm 3=16430
 Saturn, microwave spectrum 3=5274
 scintillation of radio-source, ionospheric effects 3=13713
 scintillations of sources rel. to geomag. activity 3=16423
 six intense sources, 1390 Mc/s, linear polariz. 3=9277
 source counting in steady-state cosmology 3=9254
 source counts rel. to flux densities 3=11605
 source counts, rel. to steady-state theory 3=25989
 source distrib., review 3=22223
 source positions, 112, precision meas. 3=9274
 spectra of 160 discrete sources 3=13930
 strong emission, origin in large stars 3=9255
 strong radio sources, galactic contraction theory 3=9258
 survey of sources at 408 Mc/s 3=13931
 Sydney radio source survey catalogue 3=5268
 Taurus A, 9.1 cm obs. 3=9278
 type III solar emission, 11.4 m wavelength, high-resolution studies 3=21125
 type IV radiation, from solar flares covering sun-spots 3=21126
 3C 48 red-shift 3=13932
 3C 273 source investigation by lunar occultation method 3=13937
 3C 273, super-luminous, light var. 3=23699
 Uranus, 26.3 Mc/s 3=5272
 v.l.f., origins 3=13730
 Venus and Jupiter, at 3.3 cm 3=9271
 Venus, microwave, and plasma instabilities 3=11595
 Venus near superior conjunction, 10 cm obs. 3=5275
 Venus, 4.3 mm, brightness temp. 3=11592
 Venus, 8 mm 3=5273
 Venus, 8.6 mm, brightness temp. 3=11591
 Venus, at 13 and 21 cm, brightness temp. 3=25983
 Venus, 26.3 Mc/s 3=5272
 Venus, 440 Mc/s, correl. with solar 20 cm flux 3=5276
 Virgo A, 9.1 cm obs. 3=9278
 21cm observation, smoothing effects, theory 3=13917
 384 sources at 158 Mc/s, interferometry 3=7051
 1410 Mc/s, 10 sources, linear polarization 3=9259
 1420 Mc/s principal sources, diameter and structure 3=11600

Cosmic rays

- acceleration in magnetic field 3=4252
 book 3=10184
 composition, review 3=22223
 conference, Borzhomi-Erevan, June 1961 3=15053
 conference, Kyoto, 1961 3=15054
 conference, La Paz (1962) 3=4480
 conferences, future organization 3=4549
 disturbances, catalogue, July 1961 3=18529
 energy spectrum of nuclear active particles 3=7956

Cosmic rays — contd

- Forbush decreases in intensity observed underground 3=17373
- galactic, differential energy spectrum 3=4489
- galactic, 1961 ν (Explorer 12) meas. 3=7953
- low-energy, rel. to type IV solar outbursts 3=23705
- motion in dipole mag. field, theory 3=473
- neutrinos 3=24686
- neutrinos, problem of detection 3=4527
- nuclear-active particle spectra at mountain heights 3=22237
- nuclei, energy and latitude distrib. meas. 3=2343
- nuclei, energy-spectra, space vehicle meas. 3=22229
- nuclei, heavy, correl. with chromospheric flare 3=22230
- nuclei, heavy, flux increase rel. to solar flare 3=2333
- nuclei, prod. by collision with H in space 3=619
- origin, review 3=22223
- phase anticipation in trains of diurnal oscillations 3=4481
- primary, composition, lateral distrib., spectrum, review 3=22223
- secondaries, transverse momentum obs. 3=4534
- solar, differential energy spectrum 3=4489
- solar and galactic, rel. to D-region electron prodn. 3=9083
- solar neutrino flux 3=13879
- in space research, future problems 3=4548
- two-centre model in hydrodynamical theory, interpretation 3=4544
- C¹⁴ prod. by neutrons, calc. 3=17378

absorption

- atmosphere, large shower particles 3=6120
- in atmosphere, latitude effect 3=618
- cascade showers, in Pb and Cu 3=22242
- electron-photon cascades in Pb, 200 MeV 3=19740
- μ -mesons, energy-loss-rate in Ne-methane mixture 3=24821
- μ -mesons at 40 m water-equiv. depth 3=22243
- radio noise, rel. to ionosphere F-region electron content 3=6985

apparatus

See also Particle detectors.

- absorption spectrometer, GeV region 3=24813
- air showers, large, fast-timing recording 3=12526
- automatic data recording, transistorized 3=15057
- directional intensity meas. with counter telescopes, error 3=15055
- electron and photon-energy spectra and angular distrib. meas. 3=2344
- electrons, high-energy, meas. methods 3=17368
- "ionization calorimeters", Pu α -specimen use 3=6096
- jets, 10¹¹-10¹⁴ eV, meas. analysis 3=17365
- liquid scintillator, effect of thickness in charged particle density determ. 3=4510
- meson telescope, scintillator-type 3=19717
- neutron detector for low fluxes 3=22222
- neutron prodn. by muons, detecting arrays 3=4526
- proportional counters, BF₃, large 3=19504
- scintillators, plastic, arrangement 3=12371
- showers, spark chamber as core analyser 3=15056
- spark chamber, acoustic 3=2178
- spark chamber, for lecture demonstrations 3=22221
- spectrometer calibration for nuclear active particles, 2 \times 10¹¹-10¹² eV 3=4509
- telescope, counter, 5-tray 3=19142
- tracks inside large AgCl crystals 3=7754

composition

- antinuclei proportion, spaceship meas. 3=9163
- heavy primary radiation 3=19721
- He³, abundance in primary radiation 3=6099
- ICEF project, status and results 3=4534
- nuclear active particles, momentum >1.8 BeV/c, at 3250 m 3=6097
- nuclei with Z > 3, momentum distrib. at 320 km 3=2334
- p abundance >10¹⁷ eV, galaxy spiral arm control 3=24814
- primary, at 320 km, space vehicle meas. 3=22228
- primary, isotopic analysis 3=7947
- probes outside earth's mag. field 3=19718
- showers and jets, 126 000 ft over Texas 3=6109
- solar event, H, He and heavy nuclei 3=4482
- tritons and deuterons, low-energy, in primary 3=2335

Cosmic rays — contd

alpha-particles

- electron pair prod. by 10¹⁵ eV α -particle 3=6111
- primary, flux at Minnesota, 1957 3=19722
- primary, geomag. cutoff for 49°N 3=6101
- showers, α 's > $\sim 5 \times 10^{10}$ eV/nucleon 3=19727
- showers, ang. distrib. 3=19729
- solar, rel. to flares in 1959, 1961 3=17362

deuterons

- primary radiation, low-energy abundance 3=2335

electrons

- air showers, arrival times distant from axis 3=6106
- cascade curves for high-energy positrons 3=17368
- electron-photon bursts, particle number fluct. 3=22238
- electron-photon cascades in Pb, 200 MeV 3=19740
- electron-photon component prodn. in 10¹²-10¹⁴ eV interactions 3=4538
- electron-photon showers, development rel. to polarization of medium 3=2339
- electron-photon showers, particle fluctuations 3=2342
- electron-photon showers in Pb, 50-1000 MeV 3=6105
- energy dissipation in atmosphere from vertical incidence 3=23594
- Galactic component, theory 3=616
- penetration into atmosphere and auroral effects 3=13798
- 20 keV, at 12 earth radii, 30 Sept. 1961 3=7955
- from 10¹¹-10¹⁴ eV interactions 3=19725
- > 0.5 MeV Mariner II meas., Sept.-Oct., 1962 3=22231

mesons

- Cherenkov rings, μ 's 3=17108
- diurnal variations, temp. corrections 3=12535
- equilibrium theories of prod., and jets, anisotropies 3=17367
- K⁺/ π ⁺ in atmosph., rel. to μ ⁺ polarization 3=6116
- μ , air showers, arrival times distant from axis 3=6106
- μ -mesons, ang. distrib., under thick filters 3=24822
- μ -beams in broad air showers 3=6118
- μ beams, in extensive air showers 3=4500
- μ , bursts prod. under thick Pb filters 3=22240
- μ , direct pair prodn. 3=22113
- μ , energy loss in ground 3=4522
- μ , energy loss and momentum spectra 3=17372
- μ , energy-loss-rate in Ne-methane mixture 3=24821
- μ , energy spectrum rel. to γ -ray absolute intensities 3=4537
- μ , in extensive air showers 3=4508
- μ , in extensive air showers at sea level 3=4513
- μ , heights of origin in extensive air showers 3=4501
- μ , high-energy, at depth of 40 m.w.e. 3=4525
- μ , high-energy, energy loss rate, analysis 3=24820
- μ , high-energy, by hyperon decay in EAS 3=4547
- μ -mesons, high-energy, polarization 3=6115
- μ , intensities, deep underground studies 3=4532
- μ , interact. with electrons, 0.2-1.3 GeV 3=22159
- μ , interactions in thick Pb absorber, 1-20 GeV/c 3=19735
- μ , kinetic eqn. for passage through large thicknesses 3=4528
- μ , momentum spectrum at sea level 3=10194
- μ , momentum spectrum, 80° zenith angle 3=10193
- μ , near axis of e.a.s., narrow groups 3=22239
- μ , near core, extensive air showers 3=4499
- μ , neutron prodn. 3=4526
- μ , origin, rel. to hyperon hypothesis 3=15059
- μ and π , underground (58 m.w.e.) data 3=15061
- μ , polarization, 0.2 to 1.55 GeV 3=24823
- μ , polarization, 2.1 GeV 3=24824
- μ , polarization calc. 3=4520
- μ ⁺, polarization investig. 3=6114
- μ , polarization meas. 3=4518
- μ , polarization meas. 3=4519
- μ , polarization meas. 0.2-1.55 BeV 3=4521
- μ ⁺, polarization at sea-level, calc. 3=6117
- μ ⁺, polarization at sea-level, meas. 3=6116
- μ , positive excess, rel. to east-west asymm. 3=24828
- μ , range straggling in rock, 200-100 000 GeV 3=4490
- μ , relativistic, energy loss rate 3=7882
- μ , relativistic time dilation meas. 3=11680
- μ , sea-level momentum spectra 3=2346
- μ , sea-level spectra, horizontal and vertical incidence 3=4523

Cosmic rays — contd

mesons — contd

- μ , and showers, extensive air, sea level 3=19732
- μ , in showers, number and distrib. for photon primary of 10^{10} eV, search 3=19726
- μ , single burst spectra 3=19595
- μ , spectra and polarization, Durham group meas. 3=4529
- μ , spectrum, 40 m.w.e. depth, from bursts 3=19738
- μ , transverse polarization 3=2347
- μ , underground rel. to primary composition 3=4547
- μ , variations, caused by Forbush events, calc. 3=12531
- μ , in 0.15 cm lead, electron pair prodn. 3=6113
- μ , at 40 m water-equiv. underground 3=22243
- multiple production in high-energy interact. 3=2336
- multiple production in N—N collisions 3=4541
- multiple production, semi-phenomenological approach 3=12530
- π , charged, equilb. with nuclear component in EAS 3=4547
- π , from hyperon decay 3=6112
- π and K, in jets, secondary particles 3=4543
- π -mesons; energy imparted by primaries 3=2340
- π , momentum at production, derivation 3=4529
- π -N reactions, high-energy 3=12539
- π , nuclear interactions in emulsion at 126 000 ft over Texas 3=6109
- π^0 , energy fraction imparted rel. to primary energy 3=6108
- π^0 , energy as function of primary energy, 10^{11} - 10^{12} eV 3=19737
- π^0 , energy partition with charged secondaries 3=4534
- π^0 , energy transfer from bursts 3=6103
- production, multiple, fire-ball model, many-body theoreti. approach 3=4545
- quantum H, properties 3=6110
- in showers, bundle of five μ , and new particle decay? 3=17369
- solar daily variation 3=12536

neutrons

- albedo flux, 480 to 1000 km altitude 3=22252
- atmospheric flux, S_n method 3=17371
- cascade, in EAS, inelasticity parameter 3=4547
- flux and energy spectrum, above atmosphere 3=15066
- flux meas. at sea-level and in balloons 3=22222
- sea-level intensity rel. to threshold rigidity 3=24819
- var. with latitude, anomaly, Capetown, geomag. 3=17375
- variations, sun flares, and earth mag field, crotchets, neutrons 3=22249
- C^{14} production, diffusion theory 3=17378

photons

- dose rate, meas. and results 3=9055
- electron—photon bursts, particle number fluct. 3=22238
- electron—photon showers in Pb, 50-1000 MeV 3=6105
- energy spectrum at balloon altitude 3=17379
- energy spectrum, total number, stratospheric data, 50-3000 keV 3=4492
- energy spectra and angular distrib., above and below ground 3=2344
- Explorer XI data, γ -ray astronomy 3=617
- γ -quanta spectra from 10^{12} - 10^{14} eV interactions 3=4538
- γ -radiation in jets 3=4543
- γ -ray flux measurements by Ranger 3, 100 keV-3 MeV 3=10185
- gamma-rays, high-energy at 10^5 feet 3=7944
- high energy, $> 1.5 \times 10^{12}$ eV, detection 3=15058
- origin, rel. to hyperon hypothesis 3=15059
- originating from extra-atmospheric photons 3=2337
- photon—electron showers, development rel. to polarization of medium 3=2339
- primary, ultrahigh energy, from extensive air showers 3=19719
- prod. spectra, in air, from 10^{12} - 10^{14} eV interactions, from burst sizes 3=19725
- from scattering of starlight by relativistic electrons? 3=19723
- and showers, μ numbers and distrib., 10^{10} eV, search 3=19726
- spectrum and energy release into π^0 3=4537
- X-ray burst, rel. to solar flare, 28 Sept. 1961 3=9220
- 37keV - 3.5 MeV, over Minneapolis 3=12533
- > 60 MeV, 10^6 to 60^6 , 4 mb 3=17363

Cosmic rays — contd

protons

- cascade, in EAS, inelasticity parameter 3=4547
- influx at high-altitudes 3=22247-8
- jets, $> 10^{12}$ eV, low-multiplicity, asymm. 3=7950
- July 1961, rel. to magnetic storms 3=7952
- primary, 80-350 MeV spectrum, 1961 obs. 3=10186
- sea-level intensity rel. to threshold rigidity 3=24819
- secondary particle ang. distrib., for 10^{10} - 10^{13} eV reactions 3=17273
- solar flare, induced radioactivity in Discoverer 17 3=7951
- solar, July 1961 3=22226
- solar, rel. to flare, 28 Sept. 1961 3=7953
- solar, rel. to flares in 1959, 1961 3=17362
- solar, rel. to magnetic storms, Feb. 1962 3=22225
- below 20 keV, 27 Sept.-4 Oct. 1961, Explorer 12 data 3=7954
- 0.1 to 5 MeV, at 12 earth radii, 30 Sept. 1961 3=7955
- > 10 MeV, Mariner II meas., Sept.-Oct., 1962 3=22231

effects and interactions

- See also Nuclear reactions, cosmic rays.
- aurorae, rel. to penetrating electrons 3=13798
- biological hazard at aircraft altitudes 3=11617
- in carbon, 20-150 GeV 3=4533
- C^{14} prod. by neutrons, calc. 3=17378
- Cherenkov intensity, lateral distrib. from broad air showers 3=6119
- electron pair prod. by 10^{15} eV α -particle 3=6111
- electron pair prodn. in 0.15 cm. lead by muons 3=6113
- electron—photon cascades in Pb, 200 MeV 3=19740
- emulsion, 10 km altitude, 2 + 3 + 40 p type event 3=4535
- energy transfer to π^0 mesons 3=10197
- fragmentation in interstellar space, energy depend. 3=15067
- γ , primary, ultrahigh energy, from extensive air showers 3=19719
- heavy primaries in nuclear emulsions 3=24817
- He^3 nuclei emission 3=17359
- high-energy interaction on "molecular model" of elementary particles 3=12537
- high-energy, strong damping of large momentum transfers 3=14897
- hyperon prodn. from very high energy nuclear interacts. 3=6112
- interstellar gas, heating, induction mechanism 3=23664
- jets, analysis, impact parameter approach 3=7949
- man in space, review of possible radiations 3=3633
- meson prod. in central collisions of heavy primaries 3=19739
- mesosphere, l.f. properties 3=11414
- μ , high momentum transfer phenomena 3=4532
- μ , momentum loss in thick Pb target 3=19735
- neutrino production 3=4493
- $\nu, \bar{\nu}$, study possibility 3=22253
- nuclear interact. high energy, rel. to extensive air showers 3=4511
- nuclei and photons interact. with thermal radiation in universe 3=4494
- nucleon—nucleon, 300 BeV, diagram method of calculation 3=12541
- N—N, 10^2 - 10^6 GeV, exptl. data 3=6100
- by nucleons, $> 10^{15}$ eV at 5200m altitude 3=15058
- nucleons, high energy, character 3=12538
- nucleons, high-energy, diagram method and double dispersion relations 3=12540
- pair prodn. by μ 3=22113
- protons, 10^{10} - 10^{13} eV reactions, second. particle ang. distributions 3=17273
- protons, with solar flare plasma, and electron density 3=11546
- radioactive trace production, in atmosphere, for studying movements 3=9022
- radioisotopes prod. on space H, rel. to composition near earth 3=619
- solar rays, effect on ionospheric D-region 3=13745
- strong interacts., ultra-high energy, conference 3=12646
- ≥ 30 BeV, in graphite, secondary multiplicity 3=17200
- of 1-100 GeV secondary particles of jets 3=19724
- origin
 - electromagnetic origin of cosmic ray energy 3=4495
 - electron acceleration mechanism, Veksler, inadequacy 3=17361

Cosmic rays — contd
origin — contd

- electrons, Galactic component, theory 3=616
- He³ abundance in primary radiation 3=6099
- μ -mesons and photons, rel. to hypercon hypothesis 3=15059
- nuclei, heavy relativistic, on sun 3=2333
- X-rays, source outside solar system 3=7941

primary

- α -particle flux, Minnesota, 1957 3=19722
- α -particles, geomag. cutoff for 49°N 3=6101
- antinuclei proportion, spaceship meas. 3=9163
- collision with H in space, radioisotopes prod. 3=619
- composition at 320 km, space vehicle meas. 3=22228
- constitution, at very-high-energies 3=4549
- dog-carrying satellites, doses meas. 3=3634
- energy determ. by "ionization calorimeter" 3=6100
- energy spectrum, effect of ionization loss 3=7948
- flux density of nuclei at geomag. equator 3=7946
- γ -flux, suggestion from 4 mb results 3=17363
- gamma-rays, high-energy, at 10° feet 3=7944
- γ , ultra high energy, from extensive air showers, interaction length 3=19719
- heavy, meson prodn. in central collisions 3=19739
- heavy nuclei, azimuthal distrib., 24°N 3=7943
- heavy nuclei spectrum during solar max. 3=10187
- heavy primary, composition, energy spectra 3=19721
- H, He and heavy nuclei, solar event, Nov. 15, 1960 3=22227
- He³ abundance 3=6099
- He³ nuclei abundance 3=7945
- isotopic analysis 3=7947
- isotropy 3=615
- jets, high-energy interactions, energy-detm. 3=4543
- jets, 10¹¹-10¹⁴ eV, meas. analysis 3=17365
- Mariner II meas. Sept.-Oct., 1962 3=22231
- nature, number spectrum, exponent, change 3=6098
- $\nu, \bar{\nu}$, and early stages of universe and anti-matter regions 3=22224
- $\nu, \bar{\nu}$, interaction study possibility 3=22253
- $\bar{\nu}$, fast, prod. by cosmic rays in stars, e⁺ detect. method 3=22224
- nuclei heavier than Li, relative abund. 3=7942
- nuclei of Z \geq 2 at 135 000 ft height 3=24815
- nuclei with Z \geq 3, momentum distrib. at 320 km 3=2334
- past history, rel. to meteor isotope shift 3=2
- photons, high energy, from scattering of starlight by relativistic electrons? 3=19723
- primary energy spectrum, rel. to extensive air showers 3=4511
- p abundance > 10¹⁷eV galaxy spiral arm control 3=24814
- proton spectrum, 80-350 MeV, 1961 obs. 3=10186
- and shower parameter fluctuations, high energy 3=19720
- solar event, H, He and heavy nuclei 3=4482
- from solar flares, 7-stage, (18 July 1961) 3=12527
- solar, intensity, energy spectra 3=24751
- tritons and deuterons, low-energy abundance 3=2335
- variation, spectral, during Forbush decreases 3=7959
- X-rays, possible prod. mechanisms 3=22232
- Z \geq 3 particles chemical composition stability 3=7957

showers and bursts

- "age" distrib. of showers in atmosph. 3=6120
- air shower charged particles, density determ. 3=4510
- air showers, broad, μ -meson beams 3=6118
- air showers, differential electron density spectrum 3=4504
- air showers, large, fast timing recording 3=12526
- air showers, near maximum development 3=4514
- air showers, Tokyo project 3=4515
- air showers, USSR projects 3=4516
- air showers with 10⁹-10⁸ particles, size and zenith angle 3=10195
- angular distrib., α -nuclear shower 3=19729
- angular distribution function, in cascade 3=4488
- ang. distrib., isotropic, 45-prong case, 2 \times 10³ eV release 3=19596
- arrival times of particles distant from axis 3=6106
- Auger, very high energy, structure change due to π^0 interactions 3=15060
- cascade, absorption meas. in Pb and Cu 3=22242
- cascade curves for high-energy positrons 3=17368
- due to α 's $> \sim 5 \times 10^{10}$ eV/nucleon 3=19727
- electron-photon, in brass and Pb 3=6104
- electron-photon cascade, longitudinal development 3=22234
- electron-photon cascades, energy spectrum 3=19730

Cosmic rays — contd
showers and bursts — contd

- electron-photon component prodn. in 10¹³-10¹⁴ eV interactions 3=4538
- electron-photon showers in Pb, 50-1000 MeV 3=6105
- electron-photon shower, particle fluctuations 3=2342
- electron-photon, particle number including ioniz. losses 3=22238
- electron-photon showers, rel. to polarization of the medium 3=2339
- electron radial and ang. distrib. 3=4486
- energy det. from ang. distrib. of particles 3=19733
- excited nucleon analysis, ang. distrib. 3=19728
- extensive air shower components, fluctuations, correl. 3=4508
- extensive air showers, core analyser 3=15056
- extensive air shower cores, energy composition 3=4497
- extensive air showers, development in atmosphere 3=4517
- extensive air showers, development in upper atm. 3=6102
- EAS, electron-photon component, energy distrib. 3=19734
- EAS, fluctuation character 3=6098
- extensive air showers, heights of origin of μ -mesons 3=4501
- EAS, high-energy photon-initiated 3=22236
- EAS, hyperons, role 3=4547
- extensive air showers, μ -meson beam 3=4500
- extensive air showers, muon groups near axis 3=22239
- extensive air showers, nuclear active particles 3=4497
- extensive air showers, penetrating component ang. distrib. at 200 m.w.e. depth 3=4505
- EAS, photon-initiated, existence, new indications 3=10188
- extensive air showers rel. to primary energy spectrum 3=4511
- extensive air, review 3=22235
- extensive air showers, sea-level, cloud chamber study 3=4512
- extensive air showers, sea-level, number spectrum 3=4503
- extensive air showers, sea level, structure 3=4513
- extensive air showers, size distrib. 3=22241
- EAS, size spectrum and ultra-high-energy nuclear interactions 3=24818
- extensive air showers, structure and development 3=4496
- extensive air showers, structure near shower axis 3=4506
- EAS, time variations, Sulphur Mountain July 1959 to June 1961 3=12528
- extensive air showers at 4200 m 3=4507
- extensive air showers, 10⁸-10⁶ particles, atmospheric effects 3=4502
- fluctuations in number and energy of particles, calc. 3=22233
- fluctuations in parameters, for primary determ., high energy 3=19720
- hard showers, cross-section for prod. by μ -mesons 3=4531
- hard showers prod. by high energy μ -mesons 3=4530
- high-energy, fire-ball model 3=17366
- hydrodynamic theory, two-centre model 3=6107
- ionization bursts, large, at mountain heights 3=22237
- rel. to ionospheric blackouts at Terre Adélie, 1957-58 3=5873
- jet multiplicity from single nucleon, ICEF results 3=4534
- jets, analysis, impact parameter approach 3=7949
- jets, anisotropies, and equilibrium theories of meson prod. 3=17367
- jets, composition, 126 000 ft over Texas 3=6109
- jets, conn. to Castagnoli's formula for particle energy 3=4484
- jets, description by two-centre model 3=4485
- jets, double max. ang. distrib. in photographic plates 3=5993
- jets, fireball model analysis at 10¹²-10¹⁴ eV 3=2336
- jets, fire ball model, recent studies 3=4539
- jets, γ -ray spectrum and energy 3=4537
- jets, high-energy interactions 3=4543
- jets, high-energy, N-N collisions, model 3=4542
- jets, interacts. of secondaries 3=19724
- jets, π -N interactions, 10¹¹-10¹⁵ eV 3=17364
- jets, two-centre, rel. to N-N collisions above 500 GeV 3=4540
- jets, 10¹¹-10¹⁴ eV, meas. analysis 3=17365
- jets, > 10¹⁴eV, low-multiplicity, asymm. 3=7950
- large bursts under 10.5 cm of lead 3=4524
- large, due to high energy muons 3=4523

Cosmic rays — contd

showers and bursts — contd

- large-ionization bursts, at sea level, power exponent 3=4487
- large ionizing, rel. to $2 \times 10^{11} - 2 \times 10^{13}$ eV transfer to π^0 , study at 3200 m 3=6103
- mesons, μ , bundle, five, and new particle decay? 3=17369
- μ -meson bursts under thick Pb filters 3=22240
- and mesons, μ , extensive air showers, sea level 3=19732
- mesons, μ , number and distrib., for photon primary of 10^6 eV, search 3=19726
- μ , spectra, single bursts 3=19595
- multiple meson prod., N-N interacts, 200 GeV 3=24711
- multiple penetrating particles, correl. with extensive air showers 3=4499
- N, spectra, single bursts 3=19595
- N-N interactions, > 100 GeV 3=19618
- nuclear active particles, $2 \times 10^{11} - 10^{12}$ eV 3=4509
- nuclear interacting particles, energy spectrum 3=19730
- nuclear interactions, 10^{12} to 10^{15} eV, features 3=4536
- nucleonic cascades, 3-dimensional development 3=12529
- number of particles, $10^3 - 1.3 \times 10^4$ particle showers 3=19730
- penetrating comp., ang. distrib., 200 m.w.e. depth, $10^6 - 10^8$ particle showers 3=19731
- penetrating particle deficient, due to primary photons 3=2337
- π -mesons, decrease in energy imparted 3=2340
- production mechanisms, from ang. distrib. 3=19729
- production, multiple, fire-ball model, many-body theoret. approach 3=4545
- size, and photon prod. spectra in air from $10^{12} - 10^{14}$ eV interactions 3=19725
- solar events, July 1961, balloon obs., Fort Churchill and Minneapolis 3=17370
- spark chamber detection efficiency 3=17141
- theories, high-energy, review 3=4546
- type IV burst, 27 Sept. 1960, rel. to solar flare 3=10189
- 26 GeV proton jets, azimuthal symmetry in shower particles 3=4483

variations

- allowed cone theorems, main cone at all high latitudes, extension 3=15062
- constancy in time over last 300 000 yr 3=4491
- cutoff rigidity computation method, for several geomagnetic field models 3=12532
- daily, correl. with daily mean intensity 3=7958
- daily mean intensities <50 GeV, IGY records 3=7960
- daily, study by asymptotic cones of acceptance 3=10196
- diurnal, atmospheric temp. effects 3=12535
- diurnal, max. anisotropy 3=24825
- diurnal, rel. to solar type IV outburst 3=24827
- diurnal, with inverse phase, obs. 3=24826
- due to atmosphere pressure and density changes 3=9022
- east-west asymmetry at high energies 3=24828
- equator position, spaceship meas. 3=7961
- equator at 200-300 km, space vehicle meas. 3=22250
- Forbush decrease meas. at ground and balloon altitude 3=10192
- Forbush decreases, asymmetry 3=15063/4
- at great depths, rel. to neutrino energy density 3=14953
- heavy primaries, geomag. effects, 24°N 3=7943
- increase before sudden commencement of geomag. storms 3=17376
- influx at high-altitudes 3=22247-8
- intensity distrib., Cape Town 3=22251
- latitude effect, atmospheric attenuatn. 3=618
- latitude, neutrons, anomaly, Capetown, geomag. 3=17375
- low-rigidity, motion in geomag. and external fields 3=22246
- mesons, μ , caused by Forbush events, calc. 3=12531
- nuclei, latitude distrib. meas. 3=2343
- rigidity spectrum change, correl. with short term vars. 3=12534
- semidiurnal, comparison with sunspot number and geomagnetism 3=17374
- separation of world-wide changes from daily variations 3=19736
- solar activity correl., 1958-60 3=22245
- solar daily variation 3=12536
- solar event, Sept. 3, 1960, balloon obs. 3=17377

Cosmic rays — contd

variations — contd

- solar flare, exponential rigidity spectra 3=15065
- solar protons, cutoff rigidity, rel. to mag. moment of ring current belts 3=13810
- spectral, during Forbush decreases 3=7959
- S.S.C. rise times, longitudinal distrib. 3=25951
- statistical analysis, rel. to solar flares 3=10190
- sun flares, and earth mag. field, crotchets, neutrons 3=22249
- and sun, wind velo., non-uniformity 3=21111
- and sunspot group, active, (July 1961) 3=11539
- temperature-effect of daily variation 3=22244
- $Z \geq 3$ component, rel. to solar activity 3=7957
- 20 July 1961, rel. to solar flare 3=10191

Cosmology

See also Elements, origin.

- absolute rotation of metagalaxy, relativistic theory 3=23663
- Bans-Dicke, rel. to Mach's principle 3=5234
- charge excess detection 3=18589
- continuous creation of matter, rel. to time variation of gravitational constant 3=21212
- continuous creation, testing of theory 3=21146
- cosmic cycles, theory, review 3=25970
- cosmogony, energy eqn. and virial theorem for cosmic distrib. 3=25967
- creation of matter, rel. to Mach's princ. 3=11502
- creation of neutral leptons in stars 3=11500
- density of neutrinos, gravitons, baryons in universe, upper limit 3=1507
- Dirac and steady state, and fundamental particle theory 3=23652
- direction in time of neutrino travel in some models 3=3534
- Eddington, Bondi, Dicke, and gravitation, mass, review, historical 3=21213
- electrodynamics in the expanding universe 3=21085
- expanding universe, grav. field quantization 3=11503
- expansion of universe, rel. to retarded potentials 3=16322
- fragmentation of self-gravitating gas clouds 3=11498
- gas cloud, self-gravitating, instability and collapse 3=3530
- gas cloud, uniformly expanding or contracting, fluctuation growth 3=3531
- gaseous masses, oscillations, convective instability 3=25968
- generalized Schwarzschild space, flatter regions 3=18717
- geodesics in expanding universe models 3=5232
- grav. field in expanding universe, canonical formalism 3=39
- gravitational const. variation, test using white dwarfs in galactic clusters 3=5336
- gravitational instability in nonuniform mag. field 3=9154
- gravitational instability of compressible medium 3=9156
- gravitational instability of nonuniform media 3=9158
- gravitational instability of rotating gas 3=9155
- inertia due to cosmic gravitational field 3=16504
- intergalactic absorption 3=3610
- Lorentz invariance with charge excess 3=18589
- Mach's principle and creation of matter 3=5235
- Mach's principle and zero-mass boson fields 3=23660
- magnetogravitational instability in non-uniformly rotating heat conducting medium 3=1506
- magnetogravitational instability of rotating medium 3=9159
- mass-energy ratio 3=11501
- mass of universe, rel. to relativity of inertia 3=11497
- metagalactic system, matter-antimatter processes 3=3532
- model atmospheres, non-grey, temp. distrib. 3=11499
- neutrino degeneracy, universal 3=3533
- neutrino role 3=24686
- neutrinos and antineutrinos, and early stages of universe and anti-matter regions 3=22224
- neutron massive core collapse in gen. relativity theory 3=7036
- Newtonian, with shear and rotation 3=25969
- Newton's gravitational law, validity at cosmic distances 3=23659
- nonhomogeneous isotropic universe, gravitational law 3=23662

Cosmology — contd

- nucleogenesis; exclusion principle and photobeta reactions 3=3529
- nucleosynthesis theory and Zn and Hf abundances in meteorites 3=11527
- origin of elements heavier than Ca 3=15185
- particle pot. energy rel. to creation and destruction of matter 3=5338
- photon density at point in expanding universe 3=5233
- preferred velocity, existence of, rel. to relativity 3=1
- pulsating, behaviour of light 3=13853
- and radioactive decay ages of rocks and meteorites 3=7017
- radioastronomy background criterion 3=9157
- relativistic, grav. eqn. and isotropic model 3=23661
- relativistic, model containing ultrarelativ. gas 3=13854
- relativistic, photon fluid models 3=1505
- review, development of knowledge, 20th century 3=25966
- rotating cold-gas cloud, gravitational collapse 3=7018
- space interval expression, appd. to universe as whole 3=5236
- star formation in globular clusters, random fragmentation 3=1535
- star-gas dynamics, cooperative phenom. 3=13914
- steady-state, radio source counting 3=9254
- steady-state theory, rel. to radio source counts 3=25989
- steady universe, energy prod. rel. to composition of matter 3=25972
- stellar evolution, constancy of no. of stars, "cosmic cycles" theory 3=5267
- stellar evolution, neutrino processes 3=23693
- time scales in universe 3=5283
- triality principle, extension to globally defined fields 3=11688
- universe, asymmetric behaviour in time rel. to symmetry of physical laws 3=1
- virial theorem appl. to interstellar clouds 3=18591
- X-rays from outside solar system 3=18588

Counters

See also Ionization chambers.

- angular correl. attenuation coeffs. 3=19512
- anticoincidence counting for standard materials 3=643
- arrangement of two tubes, for weak activities 3=4288
- aspiration, for aero-ions, distorting effects 3=3449
- β - γ coincidence method, dead-time correction 3=4584
- β -rays, from α -emitters, sensitivity to γ and conversion spectra 3=22110
- corona, neutron or fission fragment 3=24546
- cosmic-ray telescope, 5-tray 3=19142
- dead-time, correlation function 3=14832
- discharge chamber characteristics 3=10008
- efficiency on immersion in active medium 3=24534
- energy independence, improvement, by shields with holes 3=22028
- errors due to scatt. in vac. chamber walls and air layer 3=14812/3
- fission, by thermal neutrons 3=4289
- flow, continuous, methane, response efficiency 3=7741
- flow, using Argon: isobutanol 3=5898
- gas, halogen quenching mechanism, after current 3=24536
- gas, with subdivided wire, $C^{14}O_2$ activity meas. 3=24535
- handbook 3=2146
- hodoscopic systems with controlled pulse supply 3=24190-1
- instrumentation conference, Geneva (1962) 3=12363
- neutron, thermal, efficiency, cylindrical 3=24747
- nuclear instrument symposium 3=12364
- parameters det. from grouped samples 3=530
- point air-flow, for exoelectron detect. 3=14815
- scanning efficiency estimation 3=9998
- semiconductor p-n, review 3=2168
- semiconductor, Si junction 3=529
- solid-state quantum counters, theory 3=4299
- CdS, use for α -particles detection 3=6594

Cherenkov

- Cherenkov ring, for particle velocity meas. 3=24554
- circuit, low noise system 3=24179
- differential gas, for 3.5 BeV/c range 3=14826
- DISC, with liquid radiator 3=2164

Counters — contd

Cherenkov — contd

- DISC, velocity selection 3=2163
- efficiency of counters with lead-glass radiators 3=24555
- as fission-product monitors in water-cooled reactors 3=12738
- focusing, ethylene-filled 3=17107
- freon filled, for fast electrons 3=10096
- glycerol, total reflection, with no subdivision of radiation into thin layers 3=17110
- for neutrino detect., > 100 GeV, from electron cascades, possibility 3=17242
- for π , K-mesons, protons, up to 5 GeV/c, design 3=4297
- reactor power meas. 3=12739
- recent advances in techniques 3=17105
- review 3=24685
- review, short 3=10080
- rings, from cosmic ray μ 's 3=17108
- rings, from π 's, image intensifier 3=17109
- threshold, gas type 3=14825
- total reflection, polarization effects 3=17110
- CO_2 , focusing 3=17106

crystal

- homogeneous, history, props. and appl. 3=2165
- CsI:Tl, response to low-energy charged particles 3=7747
- NaI:Tl, large, response to β -rays, 55-83 MeV 3=14965
- NaI:Tl, response to low-energy charged particles 3=7747
- NaI:Tl spectrometer, for abs. standardization 3=17111

Geiger

- background, cosmic-ray contribution 3=24537
- coincidence circuit for const. amplitude pulses 3=9705
- electron emission, high vacuum and in atmosphere 3=24329
- ethanol-argon filled, starting voltage, parameters 3=12365
- gas parameters, propane-argon and propane-helium mixtures 3=14816
- halogen, discharge build-up and spread 3=4034
- high temp., Hg, glass lined, graphite clad, 250-350°C 3=19502
- in Injun satellite, efficiency 3=16436
- intermediate current region, with halogens 3=17096
- multiple detector systems 3=19515
- photoelectrons and their back diffusion 3=5899
- sensitive-volume det., using plastic scintillating filaments 3=4290
- thermoelectrons obs. 3=2015
- H, externally quenched, for tritium 3=644

proportional

- flow, gas gain meas., simple 3=12366
- for β -rays, weak, for radiocarbon dating 3=7829
- effect of adding polyatomic impurity gas 3=7743
- gas cell, high geometry, for weak beta rays 3=5900
- gas flow, compact, new design 3=14818
- geometry effects, recoil proton spectra 3=19631
- glass, BF_3 , thermal, for neutrons, thermal 3=24746
- halogen 3=19503
- neutron, polyethylene- BF_3 , energy vs. sensitivity 3=24539
- point anode counters 3=22029
- propane counting system, tritium analysis. 3=25857
- proton-recoil, use as neutron spectrometer 3=4412
- pulse-height selection aid 3=14493
- for radioactive dating, background suppression 3=24538
- for radiocarbon dating 3=6949
- recoil alpha-radiation effects 3=9999
- wall-less, low energy β and electron capture radiation 3=17097
- for wires and threads, longit. distrib. meas. 3=7742
- for X-rays, 10 keV, Ar- CH_4 , resolving time 3=22103
- BF_3 , background study 3=2147
- BF_3 , for fast n, efficiency, 0.1-17MeV, with simple paraffin arrangement 3=12473
- BF_3 , for neutrons, construction, gas filling 3=14817
- BF_3 in paraffin sphere, n ang. response 3=24749
- BF_3 , very large 3=19504
- Cu K α X-ray selective detection 3=24421

scintillation

- amplification stabilization of photomultiplier-amplifier circuits 3=3983
- beam profile detector for weak beams 3=2179

Counters —contd

scintillation —contd

- benzene and phenylcyclohexane, for neutrons, efficiencies 3=2278
 benzene scintillation soln., for C^{14} dating 3=12615
 benzene—toluene—PBD—POPOP mixture, use 3=4292
 beta, low-level, automatic 3=24553
 for β -ray low activities 3=17251
 for β -ray spectrometer, backscatt., noise 3=14964
 β -rays, for counting of aq. solns. 3=6185
 for β -spectroscopy 3=24883
 boron-plastic, for low neutron fluxes 3=22222
 coincidence spectrometer system, nsec resolution 3=24201
 for cosmic ray mesons 3=19717
 cyanoplatinate salts as γ -detection 3=6668
 cylindrical, efficiency for divergent γ -beams, calc. 3=2161
 decay time meas., NaI:Tl, CsI:Tl, KI:Tl 3=10005
 discrimination properties, CsBr:Tl and RbI:Tl crystals 3=24551
 dE/dx, light conversion 3=2157
 efficiency for extended plane γ -ray source 3=10006
 efficiency meas., by channels ratio, wider appl. 3=22036
 efficiency meas. without flux meas. 3=14640
 eleven, for γ - γ ang. correl. meas. 3=7821
 error eqns., with internal standards 3=22039
 γ -ray spectrometry, techniques 3=24682
 gas, luminescence, α -excited, weak, meas. 3=21447
 gaseous, structure, mechanism, applications 3=12372
 gate, fast linear, for shaping pulses for height analysers 3=19151
 gel, in chromatogram layer, for β -rays 3=24705
 glass, for slow neutrons, γ -ray background 3=10132
 hodoscope, and digital data handler for elastic scatt. 3=19506
 identification of particles observed 3=10003
 internal source scintillation spectrometry 3=24547
 large liquid, performance 3=17100
 light collection efficiency increase 3=19507
 light collection optimization for protons 3=22035
 line widths depend. on integrating time const. 3=4294
 liquid, β -ray abs. activity meas., extrapolation method 3=24700
 liquid, efficiency and background meas. 3=2159
 liquid, efficiency, external standard method 3=4293
 liquid, for low-energy beta-ray meas. 3=5991
 liquid He—Ar, improved 3=22034
 liquid, inexpensive, high flash-point, low toxicity 3=10004
 liquid, non-radiative transfer 3=10001
 liquid scintillators for use in Plexiglas containers 3=21380
 liquid systems, C-14 counting efficiency 3=2160
 liquid, use for C^{14} and T meas. 3=8022
 liquid, NE 213, for recoil protons, light output meas. 3=2266
 liquid, polyethylene containers 3=14824
 liquid, with anticoincidence shielding 3=22033
 liquid, with cooled photomultiplier 3=2156
 for lubricant film thickness det. 3=96
 mass of charged particles, meas. method 3=2158
 for n, fast, using coincidence 3=10130
 n detect., discs, pressure prep. 3=22151
 naphthalene, organic impurity addition, spectral and efficiency effects 3=24552
 neutron detection, and discrimination against γ 's, organic 3=14991
 neutron detect., single photomultiplier 3=4409
 neutrons, fast, with high resoln. 3=14990
 nuclear interact. correction 3=12518
 organic, e, α pulse differences 3=17103
 organic, particle discrimination 3=20532
 organic, quality estimation 3=2162
 organic solutes, fluorescent, with short decay time 3=5902
 paraffin, medicinal, containing PPO and POPOP 3=17104
 photo-proton telescope 3=24734
 photomultiplier, information efficiency 3=3922
 plastic scintillator NE 102, for β -rays 3=10098
 pulse amplifier, nonoverloading 3=12047
 pulse-amplitude discriminator circuit 3=9704

Counters —contd

scintillation —contd

- quaterphenyl wavelength shifter, stable as function of time 3=4296
 resolution, role of photomultiplier 3=17102
 review 3=22032
 scintillators, polystyrene-based, for visual obs. of ionizing particles 3=4295
 shallow, for cosmic rays, arrangement 3=12371
 single-channel, for quick analysis 3=15126
 use of spark discharges in prelim. meas. 3=24549
 spectrometers, for β -decay, high energy 3=580
 statistical distrib. of amplitudes of impulses 3=22038
 temperature dependence of parameters 3=24548
 time-resolution limits 3=12373
 total absorpt., for particles in GeV region 3=10097
 travelling-wave tube 3=2130
 tritiated compounds 3=17099
 two-crystal, for coincidence and summing 3=7746
 2π , liquid, for large samples meas. 3=6186
 vice-configuration β -counter 3=22037
 B-loaded, for intermed. energy neutrons 3=17293
 C^{14} -labelled cpds., specific activities 3=5901
 CaF_2 phosphors, performance 3=24550
 CsI:Tl, decay time meas. 3=10005
 CsI:Tl, response for γ -rays up to 11 MeV 3=6670
 for GeV particles, total absorption, Pb interleaved sheets, performance 3=17101
 KI:Tl, decay time meas. 3=10005
 NaI, conversion of pulse height to incident photon spectra 3=17237
 NaI : Tl crystal, photofraction, 0.32-2.76 MeV 3=19604
 NaI:Tl, decay time meas. 3=10005
 NaI:Tl dosimeters in radiation surveys 3=2170
 NaI:Tl, finite solid angle corrections 3=14823
 NaI : Tl, γ -ray photofractions, intrinsic efficiencies 3=19605
 NaI:Tl, linewidth depend. on integration time const. 3=14822
 NaI:Tl, response for γ -rays up to 11 MeV 3=6670
 NaI:Tl, 3×3 in. well-type, calc. efficiencies 3=10002
 Pb sandwich, for e detection, 1-10 GeV 3=17105
- semiconductor**
 for all nuclear radiations, review 3=12375
 α -particle detect. when large higher energy proton background 3=4478
 α -particles, Si diffused-junction detector 3=4479
 for β -ray spectroscopy 3=19616
 as fission fragment detector 3=15244
 fission fragments, multiplication phenomena, gold surface barrier 3=19509
 high energy 3=17105
 induced charge 3=12374
 pre-amplifier, transition 3=12048
 response to fission fragments 3=12376
 response to fission fragments 3=24556
 scattering chamber using junction counters 3=17095
 stepping diode, description of three types 3=10857
 surface-barrier, protection, against Hg vapour in vac. pumps 3=22043
 time characts. 3=22040
 time resolution 3=19510
 use for fission fragment meas., calibration and corrections 3=24987
 Ge, Si spectrometers, for charged particles 3=7748
 Li drift, high-energy 3=17114
 Li-drifted, prepn. 3=10007
 p-i-n type, particle identification 3=17115
 p-n junction detector, basic principles 3=4298
 p-n junction from high resist. p-type Si 3=14829
 p-n junction, reduction of ambient sensitivity 3=7749
 p-silicon, lithium, n-i-p 3=14830
 for position and energy meas. 3=14828
 pulse-shape discrimination 3=14827
 Si diodes, recoil spectra of Si for neutron irradi. 3=25307
 Si junction, compensated surface, oxide-passivated 3=22042
 Si junction detector, effect of forward-voltage ion-drift 3=2930
 Si junction detector, optimization of performance 3=7415
 Si junction, neutrons from DD and DT reactions 3=2276

Counters — contd

semiconductor — contd

- Si junction, resolution, effect of fast n damage 3=22044
- Si junction, three types, for γ -ray meas. 3=2167
- Si, p-type, for 10-30 MeV protons 3=5803
- Si, range—energy for charged particles 3=17113
- Si, surface-barrier detectors, designs 3=22041

spark

- corona-free, inhomog. fields, model for characteristics 3=2153
- corona, mechanism 3=10000
- corona, response capacity 3=12369
- efficiencies, Ar and Ne fillings 3=24541
- for image intensifier, single stage 3=9849
- γ -ray dosimeter 3=14945
- multiwire, "guardwire" type, for α -particles 3=24545
- multiwire Rosenblum and parallel-plate types 3=24542
- parallel plate, halogen 3=12370
- plane-parallel electrodes with small spacing 3=2154
- Rosenblum, influence of auxiliary circuit on pulse shape and resolution 3=24544
- use of spark discharges in scintill. techniques 3=24549
- use, strong background radiation present 3=2155
- track location in triggered multiwire type 3=24543

operation technique

- See also Counting circuits; Statistical analysis, applications, counters.
- coincidence system, multichannel, for π -N scatt. 3=16895
- data processing, computer 3=19519
- loss meas., by comparing rates of two circuits 3=14814
- pulses, elimination of superposition 3=24188
- resolving time meas., by comparing rates of two circuits 3=14814
- restoration of data in potentialoscope memory devices 3=24195
- scintillation counters, identification of particles observed 3=10003
- scintillation, tritiated compounds 3=17099

Counters, accessories

- See also Counting circuits.
- pulse amplifier, nanosec. 3=24180
- pulse-height selection aid 3=14493
- transistorized stabilized power supply 0-2000V 3=14481

Counting circuits

- absolute activity, double coinc., method 3=14501
- a.c. discriminator for pulse-height analysis 3=5613
- α -monitor with solid state detector 3=4479
- amplifiers, current-sensitive, for nuc. pulses 3=3982
- amplitude discriminator circuit for scintillation counter 3=9704
- anticoincidence scheme with nsec resolu. 3=14499
- avalanche transistor, nsec. 3=19143
- Berkeley, 210-channel system 3=19139
- β -counter, anticoincidence, for tropical conditions 3=7416
- binary scaler and digital comparator 3=1917
- Cherenkov, low noise system 3=24179
- coincidence and anticoinc. scheme using ferrites 3=14500
- coincidence, and time-to-height converters, characteristic curves tracing 3=24175
- coincidence circuit, fast—slow, nsec. range 3=12058
- coincidence, fast—slow 3=19870
- coincidence, for G.M. counter, giving const. amplitude pulses 3=9705
- coincidence, for slow scintillators 3=24200
- coincidence, GM counters as switching elements 3=19155
- coincidence meas., delayed, survey 3=9706
- coincidence, multichannel, for π -N scatt. 3=16895
- coincidence network, chronotron type 3=19156
- coincidence nsec scintillation system 3=24201
- coincidence, rapid, transistorized 3=12057
- coincidence, transistorized, with slow scintillators 3=5614
- coincidence unit, variable, HASL 3=24199
- coincidences, α - and γ -spectra 3=19157
- correction for dead-time and accidental coins. 3=16894
- dead time generator and time discrim. 3=9703
- decade scaler, transistorized, 10^{-7} sec resolution 3=24181
- decade, tunnel diode 3=5611
- decatron counter, transistorized 3=24182
- dekatron counter, reversible 3=14491
- delayed coincidences meas. 3=12056

Counting circuits — contd

- digital linear ratemeter 3=16890
- digitron, 10 Mc/s, time analyser 3=9407
- discriminator and scalar, 100 Mc/s 3=19147
- discriminator, fast, four tunnel diodes as bridge 3=19146
- discriminator for fast neutron spectrometry 3=19145
- double-delay-line amplifier 3=14483
- for eleven-counter instrument for γ - γ ang. correl. meas. 3=7821
- evaluation device for pulse-height analyser 3=353
- frequency meas. system 3=16573
- hodoscope, using ferrite-transistor elements 3=1916
- hodoscopic systems with controlled pulse supply 3=24190-1
- instrumentation conference, Geneva (1962) 3=12363
- ionosphere F_2 charge density meas. from satellite 3=13767
- kicksorter using ADC, new address logic 3=24197
- linear adding circuit, γ -ray spectrometer 3=576
- multichannel analyser, ang. correl. meas. 3=4372
- multichannel analyser, information retrieval 3=14497
- multichannel analysers for space research 3=19144
- multidetector array, method of use 3=5610
- multiparameter analysers, use in nuclear physics 3=24187
- multiple pulse display system 3=9707
- nanosecond pulse height discriminator 3=24196
- neutron identification cct, for scintillation studies 3=14489
- neutron spectrometer time analyser, μ sec. 3=3984
- nsec. time-to-pulse-height converter, mV-pulses 3=12052
- nuclear reactor period meter, time response during startup transients, computer calc. 3=12742
- one-channel amplitude analyser 3=12054
- oscilloscope system, multi-channel, for bubble chambers 3=19141
- 1 Mc/s scaler 3=354
- periodic integrator for rapid variations of counting rate 3=7414
- photomultiplier—amplifiers of scintillation counters, stabilization of amplification 3=3983
- photomultiplier output state 3=24185
- pulse-amplitude analyser, multichannel 3=14486
- pulse amplifier, automatically gain controlled 3=12049
- pulse amplifier, nanosec. 3=24180
- pulse amplifier, noise, discriminator bias 3=16891
- pulse analyzer, nuclear, linear selection memory 3=24198
- pulse discrim. for high γ -background 3=16892
- pulse encoder, fast 3=19152
- pulse height analyser encoder 3=16893
- pulse-height analyser, 50 channel 3=19142
- pulse-height analyser, 5-channel, transistorized 3=12055
- pulse height analyser for fine detail 3=19154
- pulse-height analyser, multichannel, based on chart recorder 3=3988
- pulse-height analyser, multichannel, mag. drum memory 3=21687
- pulse-height analyser, multichannel, with mag. drum memory 3=21686
- pulse height analyser, single channel, registration errors with mean value meas. 3=14495
- pulse-height analyser, 256-channel, using parametron logic 3=352
- pulse height analysers, continuous spectra, matrix method analysis 3=2235
- pulse-height analysers, 0.1μ sec gate circuit 3=12053
- pulse height discriminator, voltage sensitive tunnel diode 3=24189
- pulse-height encoder for high input rates 3=14494
- pulse-height recording from large number of counters 3=3986
- pulse-height recording system, 25-input 3=3987
- pulse-height selection aid 3=14493
- pulse generator, for bursts of pulses 3=24193
- pulse generator, nanosec. 3=24192
- pulse generator for semiconductor transient analysis 3=24194
- pulse spectrum, average amplitude 3=19153
- pulse transformers, nsec, applications 3=5607
- radioactive dating, background suppression 3=24538
- ratio ratemeter 3=5606
- reversible, using dekatrons OG-5 3=5904
- scalars, 25 Mc/s, print-punch, for accelerators 3=19140
- scaler, transistorized, for decimal counting 3=351

Counting circuits — contd

- scalers, high-speed storage type 3=24183
- scaling circuit, fast 3=14492
- scaling circuit, using tunnel diode 3=3985
- spark counters, Rosenblum, influence in parameters 3=24544
- sum-coincidence spectrometer, stabilization 3=5979
- time converter based on cathode-ray tube 3=14498
- time-of-flight, sub nsec. 3=12051
- time interval expander, capacitive 3=24186
- time intervals and resolving times meas. 3=7175
- time-to-amplitude converter, transistorized 3=24184
- time-to-pulse-height converter, fast 3=19150
- transistorized, 8.5 nsec resolving time 3=9708
- universal unit based on decatrons 3=1915
- Si junction detector, optimization of performance 3=7415

Cracks

- in abrasion of brittle solids 3=11188
- anisotropic medium, equil. and propag. theory 3=5395
- α -brass, stress-corrosion process 3=11190
- ceramics, cryst., formation and propag. 3=23356
- fatigue, propagation in sheets, theory 3=20744
- f.c.c. metals, fatigued, propagation rel. to stacking-fault energy 3=20743
- ferromagnetic films, electron microscope exam. 3=13580
- in glass plates, propag. velocity 3=13380
- glass surfaces, etching 3=11314
- glass, velocity of growth 3=3243
- on grain boundaries during creep 3=3227
- growth, stressed bodies 3=23329
- hair-line cracks, formation, stress effects, presence of H_2 3=3241
- ionic crystals, dislocation generation 3=13383
- metal, propag. in liquid metal environment 3=11185
- metals, fatigue in torsion, mechanism 3=13335
- metals, fatigue, microstructural damage 3=20735
- metals, fatigued, theory 3=20746
- photoelastic materials and glass, growth, rel. to compression 3=23363
- plane crack, in elastic body, stress distrib. 3=18216
- propag. model in brittle materials 3=13381
- propag. velos., instantaneous, meas. method, for electrically conducting materials 3=13382
- propagation, cinematographic study 3=3242
- propagation, nonstationary 3=18215
- propagation in sheet under tension 3=21275
- steel, hair-line crack formation, stress effects 3=3241
- steel, propagation, dynamic fracture 3=3242
- thermal stresses, crack in semi-infinite solid 3=9382
- in vitreous polymers, refractive index meas. 3=8579
- Al alloy 24S-T, fatigue-crack propag. 3=3244
- Al alloys, fatigued, two-stage mechanism 3=20741
- CaF_2 , surface-cracks due to wear 3=11189
- Cd, crack growth, in presence of Ga 3=20757
- Cu, fatigue-crack propag. 3=3244
- Fe-Si single crystals, propagation obs. 3=13379
- Ge, cleaved surfaces, tear marks 3=23382
- Ge, indented, ring and radial cracks 3=20758
- Ge surfaces, abraded 3=12981
- KCl, cleavage surface energy rel. to crack length 3=25178
- Mo, brittle, nucleation on twin and grain boundaries 3=6803
- Nb, surface, rel. to gas embrittlement 3=20755
- Ni-Cr, creep fracture 3=3239
- Ni-Fe films, rel. to magnetization 3=20595
- Si, as origin of dislocations 3=5064
- Si, single crystals, electron microscope exam. 3=23360
- Sn, crack growth, in presence of Ga 3=20757
- UO_2 , sintered, microfractographic obs. 3=3240
- Zn, crack growth, in presence of Ga and Hg 3=20757
- Zn, microcracks due to pyramid and basal slip 3=2797
- Zn, under low temp. thermal cycling 3=3233

Creation of electron pairs

See Electron pairs.

Creep

See also Slip.

- activation energy, anelastic solids 3=8769
- ceramics, polycryst., microstructure effects 3=23357

Creep — contd

- extrapolation, scatter of creep data 3=23331
- fatigue damage accumulation at high temp. 3=20745
- ferrites, rel. to hysteresis loops 3=8688
- ferrosilicon, rel. to substructure 3=18192
- graphite, transient, and recovery, theory 3=18196
- hollow square crystals, rel. to Bloch wall motion 3=13248
- ice beams, under repeated loading 3=8770
- Magnox AL80 3=8771
- metal tubes, apparatus with programme facilities 3=18188
- metals, activation energy and volume modifications 3=5067
- metals and plastics, stresses, from eqn. of state 3=8761
- metals, f.c.c., effect of neutron irradi., theory 3=1228
- metals, high temp., dislocation motion theory 3=23329
- metals, kinetics, high-temperature 3=18191
- metals, $t^{1/3}$ law 3=6794
- metals, transient irradiation creep 3=20717
- model, logarithmic, rel. to recovery 3=23330
- polycrystals, boundary-diffusion controlled, model 3=15997
- principle of minimum complementary energy 3=92
- review 3=25626
- rel. to viscosity and compliance estimation 3=25636
- void nucleation during creep 3=3227
- wedge indentation, into semiplane 3=3228
- Ag, depend. on O content 3=13363
- Al 3=18213
- Al, dislocation arrangements due to tensile stresses 3=20754
- Al, effects of crystal stress orientation, temp. 3=11161
- Al, fractures, obs. by electron microscope 3=8782
- Al, mosaic block disorientation 3=10682
- Al-Mg alloy, fatigue-activated, 120°-170°C 3=13365
- Al-Mg alloys, with plastic deformation 3=3226
- Al_2O_3 , boundary-diffusion controlled 3=15997
- Al_2O_3 , rel. to electrical resistivity 3=17868
- Au 3=18213
- Cd, pressure depend. 3=25630
- Cd, under simple shear 3=13366
- Co, β -phase, control by energy barriers 3=11162
- Co-Ni-Nb alloys 3=20724
- Cu 3=18213
- Cu, high-temp., dislocation config. 3=12978
- Cu-Ni system at 700-1150°C 3=15996
- Fe, at low temps., meas. 3=18193
- Fe, rel. to precipitates, 550°-700°C 3=18189
- Fe-Al alloys, activation energy 3=15995
- Fe-Al, reptation and bascule effect 3=1229
- Fe-C alloys, at high temps. 3=6791
- Fe-Cu alloys, at high temps. 3=6791
- Fe, low C content, transient creeps 3=15992
- Fe, low C content 3=23335
- Mg-Cd alloy 3=8772
- Mg-1/2 wt. % Zr alloy, rel. to grain boundary 3=16116
- MnNi, rate rel. to equilib. state, 450°C 3=6790
- MgO, high-temp. steady-state rate 3=15998
- Mg-Zr alloy ZA, at 400° and 450°C in CO_2 3=25629
- Mg-Zr, reduction by heat treatment in H_2 3=25763
- NaCl, rel. to mosaic block structure 3=20209
- Nb, compression, 800°-1200°C 3=13362
- Ni, effect of polygonization, 550°, 700° and 900°C 3=20715
- Ni, failure grain boundary cracking 3=18195
- Ni, 500°C, compressive prestrain effect 3=13361
- Ni, 500°-600°C, effect of impurities 3=25631
- Ni, part not revealed structurally, mech. 3=18194
- Ni single crystals, temp. and stress depend. 3=20716
- Ni-(Al, Co) 3=23332
- Ni-Cr, activation energy, creep fracture 3=3239
- Ni_3Fe alloy, anomaly, explanation 3=23336
- Pb, pressure depend. 3=23333
- Pb, $t^{1/3}$ law 3=6794
- Sn, pressure depend. 3=23334
- U, 550°C, tensile stress of 350 psi 3=25633
- U, irradi. creep, mechanism 3=2795
- α -U, thermal cycling during creep, incremental collapse 3=8908
- UO_2 , non-stoichiometric 3=25632
- UO_2 , stoichiometric 3=8773

Creep — contd

- Zn, nonelastic strain recovery 3=8776
- Zn, polycrystalline, anomalous activating energy 3=18190
- Zn, pressure depend. 3=25630
- Zn, rapid after-effect analysis 3=18197

Critical constants, thermal

- co-existence curve and compressibility curve near critical point 3=3786
- and condensation theory, metastable state 3=21634
- crystal lattice statistics, 7 models 3=12910
- dimethyl oxalate, semiempirical calc. 3=306
- isotherm near critical point 3=3924
- liquids, with molecular interaction 3=21314
- mixtures, Benedict, Webb, and Rubin equation 3=16844
- Ar, cellular method calc. 3=21292
- CF₄, triple point temperature 3=132
- H₂, HD, D₂, on cell model, Lennard-Jones—Devonshire 3=21318
- SiF₄ 3=21636

Cryoscopy

See Freezing; Low temperature production; Low temperature technique.

Cryostats

- for absorption spectrophotometry, -194° to -40°C 3=9651
- adjustable temp., for thermoluminescence research 3=9650
- gas-flow, for spin-echo n.m.r. spectrometer 3=14793
- for high-pressure studies, liquid-He temp. 3=19081
- intermediate temps. (4.2 - 50°K) 3=12014
- liquid He, for refractive index meas. 3=3874
- liquid-level indicator for opaque cryostats 3=24127
- liquid-nitrogen (-130 to -190°C) for neutron scattering 3=7380
- metal, for mag. susceptibility meas., 4.3° to 300°K 3=2078
- for metals, low-temp. tensile deform., thermal props. 3=9667
- for n.q.r. meas. 3=24503
- photomultiplier-cooling device, to -196°C 3=19316
- He, stub-tuner impedance matching 3=12015
- He³, for ≤ 0.34°K temps. 3=3936
- 20° to -140°C, for lab. use 3=19080

Crystal chemistry

- magnetic props., indirect interactions, model 3=3079
- rare-earth iron garnets 3=3282
- Cr spinelides, transformation rel. to calcination 3=16081
- Ge, anisotropic soln., light figures study 3=13410
- NaCl, selective etching 3=13408
- Ni chromite 3=1011
- Ni_{1-x}Mn_{2+x}O₄, rel. to composition 3=13078
- Pt-metal compounds, rel. to superconductivity 3=24148
- Si, anisotropic soln., light figures study 3=13410

Crystal counters

See Counters, crystal.

Crystal properties

- absorption, i.r., allowing for three-phonon interaction 3=20460
- creep, boundary-diffusion controlled, polycrystals 3=15997
- cubic crystals, Zeeman effect of Γ_6 level 3=15669
- cubic spinels, Madelung constant calc. 3=2689
- e.m. wave quantization, rel. to Raman spectra 3=2703
- elasticity, linear theory for polycrystals, verification 3=20684
- electrical conductivity, strong electron-phonon interactions 3=15528
- electron beams, moiré fringe patterns, dyn. theory 3=3376
- electronic conductivity in molecular crystals 3=10710
- energy, directional dependence, pseudovector 3=13261
- even effects, anisotropy, in orthorhombic and rhombohedral lattices 3=23166
- exchange interactions in magnetic crystals 3=15724
- gamma ray scatt., crystals, on nuclei, resonance 3=20067
- graphite, Kish, oxidation effects, microscopy 3=16031
- i.r. absorption at longit. optic freqn. 3=15663
- inert gases, ground-state energy, Hartree calc. 3=320
- inhomogeneous wave propag. 3=15642
- insulators, electrical, thermal shock resistance 3=17675
- ionic crystals, nuclear spin-lattice relaxation 3=6758
- ionic crystals, refractive indices, in exciton absorption region 3=23034
- ionic, specific energy, Ewald's calc. 3=10568

Crystal properties — contd

- lattice energy of molecular crystal 3=12897
- light propag. along circular optic axes 3=15648
- luminescence, book monograph 3=6664
- magnetic susceptibility, anisotropic, by ponderomotive method 3=5809
- for masers, optical, figure of merit, meas. 3=19476
- monocrystals, cathode disintegration anisotropy 3=7658
- nuclear mag. relax., hindered rotations theory 3=23269
- optical absorption in uniform field 3=15664
- optical activity, planar classes of middle-group crystals 3=20447
- optical rectification, for sufficiently low symmetry 3=5537
- optical transmission of plates, theory 3=15649
- polycrystal, elec. and thermal cond. 3=10712
- polyethylenes, mechanical dispersions 3=1400
- Raman freq. shift and broadening, temp. var. 3=10922
- Raman resonance scattering 3=3024
- Raman spectra of piezoelec. tetragonal crystals 3=3025
- scattering, Van Hove correl. functions 3=11703
- second harmonic generation of light 3=1839
- second harmonic generation, theory 3=15640
- spin-spin interactions, weak-coupling rate eqns. 3=12935
- thermal expansion, near m.p., anomalies 3=21324
- transport, h.f., freqn. depend. 3=12937
- yield, hexagonal and cubic systems, calc. 3=11157
- He^{3,4}, ground-state energy, Hartree calc. 3=320
- LiF, effect of surface charge 3=6773
- V²⁺ spectrum in octahedral coord 3=12768
- Zn, electronic and atomic, calc. 3=8395

Crystal structure

See also Polymorphism.

- alkali halides, distortion at surface, and within first 5 layers 3=25768
- alloys, domains, ordered, anti-phase 3=1357
- alloys, eutectic, impurity effects 3=13509
- austenite, fine structure due to martensitic transform. 3=20866
- boundaries, large, discontinuous displacement, on prolonged annealing 3=6809
- boundaries, simulating structure 3=3283
- chlorites, theory of polymorphism 3=23370
- chromates, magnetic susceptibilities, 80-360°K 3=5000
- crystallite size distrib., calc. from X-ray line broadening 3=13442
- cubic system, lattice complexes, values of x-coordinates 3=20810
- Cunco I, precipitation-hardened, microstructure 3=20895
- Cunife I, precipitation-hardened, microstructure 3=20895
- domains, anti-phase, one-dim. disordered 3=810
- effect on metallic corrosion 3=6919
- Ferromagnet, rel. to Barkhausen noise 3=3104
- grain boundaries, in polycrystals, diffusion-viscous flow 3=25288
- grain size, Petch reln., dislocation sources 3=17777
- graphite, cleaved surfaces 3=3261
- graphite, pyrolytic, preferred orientation and anisotropy 3=20778
- growth forms and kinetic stability 3=23388
- ice, grain boundary motion in bending 3=6527
- ice, surface, micro-size steps 3=18260
- inclusion compounds, review 3=1250
- intensities, statistical analysis 3=23430
- interfaces between different crystals, stresses and energies 3=11216-17
- intermetallic cpds., grain boundary brittleness 3=11184
- iron, carbonyl powders, mosaic block size changes on annealing 3=20873
- lattice parameters, accurate, from Weissenberg photographs 3=25699
- metals, mosaic block misorientation, by X-ray scatt., and tensile strength 3=20728
- metals, yield strength, grain size depend., preferred orient. effect 3=25628
- meteorite Nedagolla, dendritic 3=7027
- microstructure examination, using digital computer 3=13586
- moonstone, unmixing, electron microscope obs. 3=20975
- mosaic spread width, apparatus 3=13428
- Nylon 6.6 filaments 3=20863

Crystal structure — contd

- Permalloy films, effect of growth conditions 3=16047
 in physical and Fourier space, theories 3=13426
 polycrystalline material, texture, methods of study 3=20777
 polycrystals, grain orientation, effect on elastic const. 3=20686
 polyethylene, bulk-cryst., internal morphology 3=23368
 porous polycrystal, surface intergrain grooves 3=10683
 refining, least-squares computer programme 3=23432
 rubber, natural, 1000 Å-thick films, spherulite morphology 3=20919
 space groups det. using anomalous dispersion 3=13425
 steel, austenite grain growth and boundary migration rates 3=23482
 steel, mild, grain structure, effect on delayed yield 3=1227
 Thomson cubes and bipyramidal networks 3=20774
 Vicalloy, precipitation-hardened, microstructure 3=20895
 AgNO₃, -30° to 171°C 3=13401
 Al, bending stresses at grain boundaries 3=18177
 Al bicrystals, misorientation rel. to growth rate 3=11223
 Al, block misorientation, effect on strength 3=11193
 Al, constant-strain fatigue, substructure 3=11328
 Al, cyclic, under large strain ranges 3=20740
 Al, melt-grown, substructure 3=23350
 Al, mosaic block disorientation 3=10682
 Al, polygonization, annealing of dendritic single crystals 3=3335
 Al, substructure of spherical crystals 3=23463
 Al, substructure under constant cyclic strain 3=20742
 Al—Cu solid solutions, matrix block struct. changes 3=20906
 AlNiCo 500, AlNi, magnets constituents, by microsonde and microhardness 3=16090
 Alnico, magnet sintered 3=16094
 Al—Si solid solutions, matrix block struct. changes 3=20906
 Al—Zn alloy, Guinier—Preston zones 3=8881
 Al—Zn alloys, ageing, GP zone effects 3=11295
 BaTiO₃, compensation of ferric ions in lattice 3=11196
 BaTiO₃, domain orientation, rel. to mechanical load 3=22995
 Bi and Bi—Sb alloys, grain size, effect on resist. elec. and Hall coeff. 3=20323
 Bi—Pt alloys between PtBi and PtBi₂ 3=11280
 CaWO₄, cellular structure, grown from melt 3=25665
 CdS, films 3=22941
 CdTe films, rel. to deposition temp. 3=23508
 Co, α - and β -phases, interrelationship 3=1257
 Co—Ni—P alloys, fine-particle structure of electro-deposits rel. to heat treatment 3=16097
 Co—P alloys, fine-particle structure of electrodeposits rel. to heat treatment 3=16097
 Cu and electrographite, changes during friction 3=6807
 Cu bicrystals, grain boundary diffusion of Ag 3=6533
 Cu, films, grain structure and distortions 3=2817
 Cu, films, polygonal, formation, by electron microscopy 3=15494
 Cu, grain and subgrain structure, effect of deformation and annealing 3=20945
 Cu salicylate, modifications, mag. different 3=23374
 Cu—Al martensites, microstructure obs. 3=20869
 CuAl₂—Al eutectic alloys, solidification 3=11283
 Cu₃Au, antiphase boundaries 3=18334
 Cu₃Au II, domain size 3=13532
 CuAu II, superlattice, long-period 3=1358
 Cu₃Au, yield stress rel. to antiphase domain size 3=16001
 Cu—Bi alloys with oxide platelets 3=18221
 Cu—Fe mixed whiskers 3=20796
 Cu—Sb alloys, interfacial free energy 3=16096
 Cu—Si alloys, with spherical oxide particles 3=18221
 Fe alloys, annealing effects 3=8903
 Fe, $\alpha = \gamma$ interface 3=13494
 Fe, Ce distrib. on sub-boundary zones 3=20229
 Fe, cold worked, cellular, by electron microscopy 3=13521
 Fe, microstructural changes during torsion 3=6857
 Fe—Al alloys, "K-state" and order data 3=23467
 Fe—N alloys, hexagonal, and effect of hybrid bonding orbitals 3=8884
 Fe—Ni alloy, effect of martensitic transform. 3=20866

Crystal structure — contd

- Fe—Ni 50/50% alloy, cube texture, rel. to grain size and impurities 3=16112
 Fe—Si sheets, secondary grains, growth 3=16108
 Ga—Sb—Te system 3=25732
 Ge, cleaved surfaces 3=23383
 Ge dendrite strips 3=18281
 Ge, domain formation, rel. to deformation and annealing 3=17772
 H, second-order transitions 3=6450
 Ni, grain growth kinetics 3=20904
 Ni, polygonization, effect on creep, 550° 700° and 900°C 3=20715
 Ni—Mo alloy, grain growth kinetics 3=20904
 Ni—Ta alloy, grain growth kinetics 3=20904
 LiAl, n.m.r. study 3=11122
 LiGa, n.m.r. study 3=11122
 LiIn, n.m.r. study 3=11122
 KMnF₃, transition, 179.5°K and specific heat 3=8365
 MnHg, distortion and magnetic transition, -75°C 3=6860
 Mn₂Ge₃, domain structure 3=23481
 MnZn, distortion and magnetic transition, -125°C 3=6860
 Mo, grain boundaries, rel. to irradiation hardening 3=4881
 Mo, subgrain boundaries 3=20212
 NaCl films, rapidly condensed, orientation 3=8799
 NaTl, n.m.r. study 3=11122
 Nb oxides, from X-ray and electron diffr. 3=13458
 Nb—Sn supercond. wire, microstructure exam. 3=13586
 Ni-base cast alloy, complex 3=11281
 Ni—Cr base alloy, heat treatment effect 3=18351
 NiO, multiple twin domains and domain walls 3=1146
 Si, cleaved surfaces 3=23383
 Si—Fe, sheet, transformer, grain-oriented, after annealing 3=16098
 Si—Fe, rolled and annealed, "microband" contrast difference between, sub-grains 3=25739-40
 Sn, grain boundary segreg. of Tl 3=16118
 Sn, grain structure, effect of Zn and Na traces 3=3334
 Sn, recrystallized surface, effect of Zn and Na impurities on grain growth 3=20760
 Sn, surface features and structures 3=18341
 Ti, preferred orientation, effect on Hall coefficients 3=22906
 Ti, sputtered films, effect of dissolved gases 3=25328
 TiC—WC—Co 3=3316
 TiC—WC—Co alloys 3=18184
 Ti azides, particle size changes on X-irradiation 3=22873
 U, grains, unrefined, from ultrasonic pulse scattering 3=13496
 U—Cr alloys, grain refinement by cooling 3=3322
 UO₂, microstructure, evolution during fuel rod irradiation 3=25650
 V, grain size, rel. to plastic deform. 3=13351
 W, cast, effect of recryst. anneal 3=11183
 WC—Co, macroscopic structure, rel. to electrical resistivity 3=13497-8
 W—Re alloys, by field ion microscopy 3=18340
 Zn, boundary migration after recrystallization 3=23407
 Zn, substructure microsegregation and hardness 3=6792
 Zn—2% Au, rapidly solidified, regular cell pattern, etching obs. 3=23470
 ZrO₂, films meas. 3=8577
- Crystal structure, atomic**
 See also Crystals, electron states; Crystals, lattice mechanics; Electron diffraction crystallography; Neutron diffraction crystallography; X-ray crystallography.
- analysis by computers, conference, Moscow 1961 3=16063
 analysis of 3-dimensional Patterson maps by vector verification 3=18302
 analysis by trial and error, convolutions 3=18301
 atomic radii, close-packed and body-centered cubic structures 3=18305
 Bravais lattices in four-dimensional space 3=8815
 coherent rearrangement, in phase transformations 3=3284
 field ion microscope, recent developments 3=19370
 interstitials, equil. distrib., crystal symm. 3=25271
 isotope effects, temp. var., review 3=23439
 many-component disordered crystals, term splitting, min. number of coordination spheres 3=22624
 module building blocks, for teaching and research 3=11653

Crystal structure, atomic — contd

- molecular, close-packed arrays 3=13391
- by n.m.r., review 3=13314
- parameters refinement by direct calc. of minimum residual 3=25701
- phases det. by linear eqns. between structure factors 3=25702
- polyhedron forms, transforms, calc. 3=16053
- single isomorphous-replacement method, heavy atom config. 3=3290
- space group determ. using anomalous dispersion 3=8826
- structure amplitudes of 2 related crystals 3=18304
- structure invariants, new relationships 3=25700
- symmetry of Fourier space 3=8816

elements

- diamond, allotropic conversion at 3000°C, graphite orientation 3=20776
- graphite, artificial, anisotropy, by neutron diffr. 3=5101
- graphite, effect on rhombohedral modification of oxidation, Br and K 3=18308
- graphite, pyrolytic, rel. to elec. props. 3=826
- inert gases, stability of cubic structures 3=23441-2
- metals, rel. to mag. ground state theory 3=3094
- noble metals, lattice spacings 3=8874
- possible hexagonal polymorph of diamond 3=3298
- Ag, contraction of unit cell 3=16062
- Ag, films, effect of quenched-in vacancies 3=22733
- Au, lattice consts., temp. depend. to 878°C 3=10605
- B, rhombohedral modification 3=13449
- Be, lattice parameters, temp. depend. 3=3297
- C, new phase above 150 kbar 3=18229
- C, pyro, heat treatment effects, up to 2900°C 3=20949
- C, pyro layers, effect of heat treatment 3=20272
- Co, films, for n polarization, var. with electrolysis conditions 3=23509
- Co submicron whiskers 3=23412
- Cr, electron distribution 3=6840
- Cr, rolled, 700°-1700°C 3=5100
- Cu, effect of low-temp. deformation and annealing 3=20945
- Cu, films, effect of quenched-in vacancies 3=22733
- Cu, lattice dilation, hard-drawn fine wires 3=18212
- Cu, line widths and crystal dislocations 3=20946
- D, by neutron diffraction 3=1319
- Dy, structure change at 86°K antiferro-ferromag. transition 3=15755
- Fe, number of 3d-electrons 3=8862
- Fe submicron whiskers 3=23412
- Ge, anomalous X-ray transmission 3=5099
- Ge, containing dislocations, and X-rays, anomalous transmission 3=20947
- Ge, epitaxial films on single crystals 3=3280
- Ge, grown under constitutional supercooling 3=13415
- Ge, at high pr. metallic modifications 3=11210
- Ge, periodicity and anomalous X-ray transmission 3=18307
- Ge, X-ray reflection 3=1318
- Ge (111), X-ray diffr., asymm. Bragg case 3=5098
- H, by neutron diffraction 3=1319
- H₂, isotopes, constant doubling 3=18308
- Hf, at high pr. 3=13451
- Li, lattice parameters, isotope effect, temp. depend. 3=6842
- Mo filings, X-ray refl. 3=16068
- β-N 3=6839
- Ni, as-plated deposits 3=13450
- Ni, monocrystal films, superlattice 3=8835
- Ni, substructure, grown from melt 3=1271
- Np, changes on heating, thermal expansion 3=10606
- P, black 3=13399
- Pd, role of hydrogen atoms 3=25749
- Pu, changes on heating, thermal expansion 3=10606
- Pu, α and β forms 3=25706
- α-Pu, < 50°K, by X-ray diffr., absence of phase transf. 3=20833
- β-Pu 3=13448
- Sb, at 4.2°, 78°, 298°K 3=18308
- Si, at high pr. metallic modifications 3=11210
- Si, X-ray diffr. patterns, single crystal 3=5097
- Sn, grey and white, interreln. 3=11209
- Sn, grey, atomic scatt. factors 3=16069

Crystal structure, atomic — contd
elements — contd

- β-Sn, transition to b.c.c. form under pr. 3=13452
- Ti, at high pr. 3=13451
- α-U 3=8837
- α-U, atomic positions, 22°-600°C 3=25705
- U, α-phase, variation with temp. near 43°K 3=6841
- U, changes on heating, thermal expansion 3=10606
- U, oxidized in air at increasing temps. 3=3250-1
- W microcrystals, up to 60 Å diam., surface structr. 3=3296
- Xe 3=6480
- Yb, transition from f.c.c. to b.c.c. 3=6817
- Zr, at high pr. 3=13451

alloys

- autoradiography investigations 3=3318
- binary, liquid-like, neutron or X-ray scatt. data interpretation 3=11282
- α-brass, lattice parameters, from powder diffraction photographs 3=25738
- eutectics, rel to nucleation 3=13503
- f.c.c., binary, ordered, stable antiphases 3=20881
- Inconel-X 3=20872
- intermetallic AB₂ compounds, with atomic radii $r_A > r_B$ 3=20892
- lattice spacings rel. to Brillouin zones 3=8874
- local order, mean vibr. state of atoms 3=8347
- β' martensite in Cu-Al alloy 3=25736
- "modulated" structure, side bands on X-ray patterns 3=8879
- Permalloys, long-range ordering, diffractometer study 3=18337
- pseudosilicides, prediction of occurrence 3=25725
- rare earth binary alloys with Au and Ag 3=18336
- rare-earth-Cu₂ compounds 3=20874
- rel. to spontaneous magnetization 3=1350
- short-range order, nature, destruction 3=8905
- short range order, rel. to paramag. theory 3=3085
- solid solns., Guinier-Preston zone formation 3=8910
- solid solns., Guinier-Preston zones rel. to physical props. 3=8877
- solid solns., Guinier-Preston zones, spatial distrib. 3=8878
- solid solns., planar and spherical zones 3=8875
- solid solutions, f.c.c., stacking faults 3=8442
- Vegard's law, prediction of departures 3=3319
- Vikalloy, variation during tempering 3=5113
- Ag-base, rel. to solute, X-ray diffr. study 3=2811
- β'-AgCd 3=13501
- Ag-Cd, h.c.p. ε and η phases 3=6856
- Ag-Cd, lattice spacings 3=3313
- Ag-Zn, h.c.p. ε and η phases 3=6856
- Al-Ag, formation of Guinier-Preston zones 3=11284
- Al-Ag(25%) alloy, films, by electron diffr. 3=6884
- Al-Cu, Guinier-Preston zones 3=8876
- Al_{0.89}Mn_{0.11}, lattice parameters, Mn mag. moments 3=25737
- Al-Tc system, phases TcAl₁₂, TcAl₄, Tc₂Al₃ 3=13520
- Al-Zn, formation of Guinier-Preston zones 3=11284
- Al-Zn, G.P. zones 3=20865
- Al'-30% Zn, spherical pre-pptn. zones 3=8911
- Al-Zn-Mg, G.P. zones 3=20865
- Au-Cd, α, α₂ and β' phases 3=6855
- AuCuII 3=8880
- Au-Cu-Ni, long-range 3=18348
- AuCu₃, ordering, temp. var., by quenching 3=20871
- Au-Mn, new hexagonal phase between Au₄Mn and Au₂Mn 3=3312
- Au-Zn, h.c.p. ε and η phases 3=6856
- Bi-Pb, hexagonal close-packed 3=8883
- Bi-Si, heated to 600°C, electron diffrn. study 3=25788
- Bi-Te, solid solubility rel. to composition 3=3343
- Bi₂Te₃-Bi₂Se₃ alloys 3=13500
- Bu-Pt alloys between PtBi and PtBi₂ 3=11280
- CaAg rel. to similar types 3=18338
- CaGe rel. to similar types 3=18338
- CaSi rel. to similar types 3=18338
- CaSn rel. to similar types 3=18338
- CdIn₂Se₄ 3=25350
- CdIn₂Te₄ 3=25350
- Ce-Eu alloys, susceptibility, rel. to electron structure 3=15757
- CoAl, electron distrib., X-ray meas. 3=16092

Crystal structure, atomic — contd

alloys — contd

Co₂Mo₃, σ -phase 3=18333
 Co—P electrodeposits 3=11052
 CrB rel. to similar types 3=18338
 Cr—Mn(15%), by neutron diffr., superlattice peak and antiferromag. 3=18110
 Cr—Nb—Ni, rel. to temp. and Ni content 3=5119
 Cr—Ni, equil. diagram 3=11289
 CrTe, several phases 3=16095
 CrTe_x 3=23464
 Cu—Al, β' martensite structure 3=18335
 Cu—Al, constitution, effect of quenching 3=20868
 Cu—Al martensites, by electron micro. and cryst. 3=20869
 Cu—(Al, Zn), short-range order 3=23348
 CuAu, above order—disorder transition point 3=3321
 Cu₂Au, short range order parameters 3=23465
 Cu₂Au superlattice 3=1356
 Cu₃Au superlattice, off-stoichiometric 3=13495
 CuAu II grown from disordered state 3=8902
 Cu-base solid solns., local atomic displacements 3=3341
 Cu—Be, aged, orientations of new phases 3=16099
 Cu—(Zn)Be, GP zone 3=13493
 CuCd₂, X-ray study of ϵ -phase 3=25735
 Cu—Ni, rel. to paramag. props. 3=3085
 Cu—(10–20 wt.%)Pd, order—disorder 3=20870
 Cu—Se, heated to 600°C, electron diffrn. study 3=25788
 Cu—Zn, h.c.p. ϵ and η phases 3=6856
 Fe—Al alloys, short range order coeffs. 3=13505
 Fe—Al, "K-state" and order data 3=23467
 Fe—Al, ordering, atomic configs., theory 3=6871
 Fe—Al, short-range order 3=3327
 Fe₂Al superlattice 3=16102
 Fe—3.8% Au solid solution, Guinier—Preston zones 3=8882
 Fe—C submicron whiskers 3=23412
 Fe—Co, atomic ordering, by neutron diffr. 3=13506
 Fe—Cr—C, austenite—martensite transform. 3=18346
 FeMo 3=13492
 Fe—Ni—Cr—Ti system, χ -phase 3=3314
 Fe—Ni, f.c.c., lattice parameters of two structures 3=20114
 Fe—Ni, Fe₂Ni superstructure 3=8897
 Fe—Si, orientation meas. from etch pits 3=8873
 Fe—Si, up to 1200°C, rel. to Si content 3=10602
 HfC—UC solid solns. at 2000°C 3=25759
 Hf₅(In_{0.5}Sb_{0.5})₃, lattice parameters 3=25725
 Hg[Cd]Te—In₂[Ga₂]Te₃, solid solutions 3=11301
 Hg—Sn, constitution diagram 3=13504
 HoCo₅ 3=8882
 LaCu₂, as AlB₂ 3=20874
 Mg—Cd, ordered 3=23479
 Mg—In, h.c.p., local order, X-ray diffuse scatt. study 3=25744
 Mg(Mn,Cd), Cu(Ni), Zn(Ga,In,Ge), ternary Laves phases 3=16091
 Mn—Al, Cu substituted, effect of Cu content 3=25529
 Mn—Ga, ϵ phase, lattice consts., by X-ray diffr. 3=15900
 MnTe, high temp., fictitious transforms. 3=23469
 Mo(Al, P)₂, lattice parameters 3=25725
 MoB rel. to similar types 3=18338
 Mo—Ni, δ phase 3=25743
 Mo—Tc system, superconducting phases 3=19113
 NbB rel. to similar types 3=18338
 NbCr₃, rel. to temp. and Ni content 3=5119
 Nb—Ni of W₂Fe₃ type 3=16093
 NiAl, electron distrib., X-ray meas. 3=16092
 Ni-base alloys, K state and binding forces 3=5114
 Ni—Be, aged, orientations of new phases 3=16099
 Ni—Be, changes at early ageing state 3=13507
 Ni₂Mn, mag. structure rel. to order 3=18080
 Ni₂Mn ordering temp. and mag. moment 3=20623
 Ni—P solid solutions, acid deposited 3=20875
 Ni—P solid solutions, acid deposited, changes on heating 3=20876
 Ni—Se, heated to 600°C, electron diffrn. study 3=25788
 PbBi₂Te₃, second superlattice structure 3=13508
 PbSe—Bi₂Se₃ system 3=25742
 Pd, binary, meas. and band model 3=1126
 Pt₂Fe, unit cell dimensions 3=25745
 PuNi rel. to similar types 3=18338

Crystal structure, atomic — contd

alloys — contd

Re—Mo, 2 σ -phase, atomic order, from powder photographs and X-ray diffr. 3=25752
 Rh—Fe 3=3320
 Sb—Te, solid solubility rel. to composition 3=3343
 Si—Fe, deformed, substructures and recrystallization 3=23468
 TaB rel. to similar types 3=18338
 Ta—Ni of W₂Fe₃ type 3=16093
 ThAl rel. to similar types 3=18338
 ThCo, rel. to similar types 3=18338
 Th₂Pd₃ 3=20878
 Th₂Pt₃ 3=20878
 ThX (X = Pt, Rh, Co, Ru, Ir), X-ray powder patterns 3=11279
 Ti—Al, three phases meas. 3=13502
 Ti—Cr, effect of heat treatment 3=20879
 TiFe₂—ZrFe₂ 3=20880
 Ti—Rh, effect on superconductivity crit. temp. 3=7407
 Ti₃Se₄ 3=1346
 Ti₂Te₄ 3=1346
 TlI rel. to similar types 3=18338
 α U—Pu, lattice consts. at room temp. 3=25733
 V₂Se₄ 3=1346
 WB rel. to similar types 3=18338
 WO bronzes 3=25390
 YCo₅ 3=8682
 YSi rel. to similar types 3=18338
 ZnIn₂Se₄ 3=25350
 ZnIn₂Te₄ 3=25350
 ZnSb—CdSb, pseudo-binary section 3=1348
 ZrC₂—ZrFe₂ 3=20880

Inorganic compounds
 adamantine cpds., deriv. using hexagonal nets 3=6847
 alkali halide phosphors 3=23100
 aluminates, Al—O, tetrahedral distance 3=25715
 andalusite, Fe³⁺ ion isomorphism, by e.s.r. 3=20855
 anhydrite (CaSO₄), redetermination 3=25717
 beryllides, unit-cell volumes, rel. to components 3=23446
 borax, n.m.r. data 3=15963
 cementite 3=23447
 cementite (Fe₃C) 3=5106
 chabazites, rel. to ion diffusion 3=6534
 chlorite, correction 3=8860
 cronstedtite, polymorphism 3=8854
 cubic diamond-type, rel. to covalent bonds 3=10618
 cuprous chloride spinel, α = 8° 265A 3=1326
 daltonides, calc. from elec. props. 3=10762
 diamond, surfaces, clean 3=11312
 dolerophanite, Cu₂O(SO₄) 3=25718
 dumontite 3=16086
 ferrites, hexagonal structures related to Ba₂Zn₂Fe₁₂O₂₂ 3=23458
 garnets 3=15867
 glass, titaniferous, coord. state, spectral data, 3=25459
 glasses, phosphate, two and three-component 3=8602
 graphitic oxide, oxygen atoms distrib. 3=5107
 "hydrobiotites", layer sequences 3=20858
 hydrosodalite, unit cell and space group 3=23461
 ice, surface 3=21307
 lomonosovite—mürmanite group minerals 3=18325
 magnetoplumbite structure, cation sites, charge compensation effects 3=1822c
 micas, polymorphism theory 3=13482
 mordenite-type, 6 possible structures 3=20856
 muscovite, vibrations of OH ions 3=13164
 quartz, regularity of SiO₄ tetrahedra 3=18319
 α -quartz, room temp. bond lengths 3=18318
 rare-earth iron garnets 3=3282
 rare earth metal oxides, neutron diffrn. 3=5105
 silicates, Si—O, tetrahedral distance 3=25715
 sklodowskite 3=16085
 spinels, cation distribution 3=8863
 spinels, cation distrib. and i.r. spectrum 3=13184
 spinels, cubic, ferrimagnetic spiral theory 3=11100
 stishovite (SiO₂), X-ray meas. 3=5108
 sulphoarsenides, polyhedra 3=18328

Crystal structure, atomic — contd

inorganic compounds — contd

III-V compounds, rel. to elastic moduli, hence Debye temp. 3=22666

tincalconite, n.m.r. data 3=15963

transition metal phosphides, binary 3=13453

transition metal sulphides, groups IV, V, VI, review 3=23449

Tutton salts, $K_2Zn(SO_4)_2 \cdot 6H_2O$ and $K_2Mg(SO_4)_2 \cdot 6H_2O$, n.m.r. data 3=8740

vaterite ($CaCO_3$), lattice consts., from X-ray and optical data 3=25727

$A_2B^{II}O_6$ type, unit cells 3=16077

ABO_4 , where A is rare-earth, B is Nb or Ta 3=25726

Ag halides, Ni^{2+} doped 3=6654

$Ag_2C_2N_2O_8$, crystal structure 3=13478

AgI, hexagonal 3=5102

AgI, hexagonal 3=18310

AgN_3 , unit cell dimensions 3=11265

Ag_2O , $2^\circ - 80^\circ K$, rel. to specific heat 3=769

Al carbonitrides 3=18320

Al (36.5–99.92 at.%)—Rh, lattice spacings 3=18339

$13 Al_2O_3 \cdot 6SO_3 \cdot xH_2O$ ($x \approx 79$) 3=13469

$13 Al_2O_3 \cdot Na_2O \cdot 8SeO_3 \cdot xH_2O$ ($x \approx 73$) 3=13468

$1.71 Al_2O_3 \cdot SiO_2$, mullite, statistical model 3=20857

Al_4C_3 , X-ray diffr. pattern 3=23445

Al_4O_4C 3=11268

Al_4O_4C , X-ray diffr. pattern 3=23445

AlP, bond length and order rel. to electron transfer 3=20044

AlSb, at high pr. 3=11211

As(CN)₃ 3=8849

As₂Se₃, amorphous, films 3=13461

As₂Se₃, short-range order 3=10802

As₂Se₃, unit cell, space group 3=18364

As₂Se₃—As₂Te₃, low-temp. 3=18364

As₂Te₃ 3=13456

As₂Te₃ 3=18364

As₂Te₃, amorphous, films 3=13461

B borosilicate glass, radial distrib. 3=13483

B₁₈H₂₂ 3=19990

B₁₈H₂₂, molecular structure 3=5109

BN, dense forms 3=11203

BP, bond length and order rel. to electron transfer 3=20044

B₁₃P₂ 3=6844

Ba borate glasses, X-ray study 3=11269

(Ba,Bi)FeO₃ 3=3277

BaGeO₃, high-temp. form 3=1300

$BaM^{II}M^{III}O_{12-x}F_x$ ($M^{III} = Al^{3+}, Ga^{3+}, Fe^{3+}; M^{II} = Ni^{2+}, Co^{2+}, Cu^{2+}, Zn^{2+}$) substitutions 3=1013

Ba₂Mg₁₇ 3=20837

Ba₂Mg₁₇ and Mg substitution solution on super-lattice 3=20838

Ba(NiW)_nO_p, phase transitions 3=8864

BaSO₄, barite 3=13471

BaTiO₃, cubic to tetragonal transition 3=6816

BaTiO₃, effect of MnO, doping 3=8560

BaTiO₃, refinement 3=1331

BaTiO₃, rel. to hydrostatic pressure up to 600 kg cm⁻² 3=3302

BaTiO₃, rel. to hydrostatic pressure up to 600 kg cm⁻² 3=6848

BaTiS₃ 3=8850

Ba₂ZrAs₂O₈ 3=10982

Ba₂ZrP₂O₈ 3=10982

BaZrS₃ 3=8850

BeO, c-axis, rot. of sub-crystal 3=2818

BeO, high temp. polymorph 3=1320

BeO, neutron irradi. 3=18298

Bi_{1-x}Te_{3-x}Se_x solid soln. 3=13511

Br hydrate, by X-ray diffr. 3=18312

Ca halophosphate, Mn, Sb-activated 3=3038

Ca orthophosphates, hydrogen bonding, X-ray diffr. and i.r. data 3=8865

CaB₂O₄ 3=13467

CaC₂ 3=1328

Ca₂(Fe_{1-x}Al_x)₂O₂₀ solid solutions, rel. to structure 3=1340

Ca₂GeO₅ 3=23373

CaMgB₆O₁₁·6H₂O = CaMg[B₃O₄(OH)₃]₂·3H₂O 3=8861

Crystal structure, atomic — contd

inorganic compounds — contd

Ca(NO₃)₂·4H₂O, unit cell, by X-ray diffr. 3=16084

CaSO₄ 3=23453

Ca₂V₂[Si₂O₁₂][CO₃]H₂O, kainosite, unit cell and space group 3=13473

CaZrS₃ 3=8850

Cd(NO₃)₂·4H₂O, unit cell and space group, by X-ray diffr. 3=16084

CdS, excess Cd, effect of annealing 3=11262

CdS, high-pressure 3=23443

CdS, high-pressure phase 3=20834

CdSe, high-pressure phase 3=20834

CdTe, high-pressure 3=23443

CdTe, monocrystalline films, on mica and NaCl 3=20944

CeC₂ 3=1328

Ce₂C₃ 3=1328

Ce₂₄C₆ 3=8844

Ce₂Ge₃ 3=8842

Co uranate 3=3320

Co²⁺ site preference, effect of anion charge compensation 3=18222

Co(AlCl₄)₂ 3=1330

Co₂C, electron diffraction study 3=1324

Co₃C, electron diffraction study 3=1324

CoCl₂·6H₂O, orientation of H₂O molecules 3=1201

CoCl₂·2H₂O, proton structure 3=20853

Co[Hg(SeCN)₄] 3=16083

CoMoO₄ 3=5110

Co₂S₃ 3=8840

CoSb₂ 3=13518

CoSO₄·H₂O 3=18327

CoSO₄·6H₂O 3=8851

CrO, powder pattern 3=23369

Cr₃Se₄ 3=3320

CrVO₄, high-pressure form, rutile 3=11270

CsBeF₃ 3=20847

Cu₂[A^{IV}B₃V^{VI}] type, semiconducting materials, crystal structure 3=13513

Cu₂B₁₀H₁₀, X-ray study 3=3303

CuFeS₃ 3=1027

CuFe₂S₃ 3=11049

γ-CuI 3=20835

CuIO₃(OH), salesite 3=1338

CuMn₂O₄, cation disposition, inversion 3=20846

Cu_{0.85}NbS₂, comparison with NbS₂ and MoS₂ 3=16078

CuO by neutron diffraction 3=126

(CuO)_x(Mn₂O)_{1-x} 3=8521

Cu₃(PO₄)₂(OH)₄, pseudomalachite 3=3307

Cu₂S, high chalcocite 3=23448

CuSO₄·H₂O 3=18327

Cu₂(SO₄)(OH)₂, antlerite 3=8866

Cu₂TiX, CsCl-type structure 3=1344

Cu₂ZrAl, CsCl-type structure 3=1344

Cu₂ZrZn, CsCl-type structure 3=1344

DCrO₂, O—O bonds by neutron diffraction 3=1334

Eu₂O₃ 3=5104

EuS, rel. to mag. props. 3=11050

EuSe, rel. to mag. props. 3=11050

Eu₂SrO₄ 3=5104

EuTe, rel. to mag. props. 3=11050

FeBr₂, powder, 400°C 3=25710

ε-Fe₂₋₃C, electron diffraction study 3=1324

λ-Fe₂₋₃C, electron diffraction study 3=1324

Fe₂C, by electron diffr. 3=20867

Fe₂C, interplanar spacings, tables 3=13455

θ-Fe₃C, electron diffraction study 3=1324

Fe—Ge alloys, meas. and theory 3=11030

βFeOOH, colloidal 3=18408

β-FeOOH, by electron diffraction 3=1333

Fe₃O₄, magnetic, electron diffr. study 3=1148

FeSi, neutron diffrn. study 3=25543

FeSO₄·H₂O 3=18327

FeSO₄·7H₂O, using Mo Kα radiation 3=6850

FeTiO₃—αFe₂O₃, rel. to ferrimag. props. 3=3133

FeVO₄, high-pressure form, using orthorhombic unit cell 3=11270

Ga arsenides, lattice periods, effect of surplus Ga or As 3=20836

Crystal structure, atomic — contd**inorganic compounds — contd**

- GaAs, bond length and order rel. to electron transfer 3=20044
 GaAs, change on melting 3=5448
 GaAs, major faces, growth axis 3=13404
 α -Ga₂S₃ 3=25711
 GaSb, bond length and order rel. to electron transfer 3=20044
 GaSb, at high pr. 3=11211
 3Ga₂O₃·4SO₃·9H₂O 3=13470
 Gd—ceric earth mixed garnets 3=3125
 Ge films, rel. to evaporation parameters 3=20926
 Ge, surfaces, cleaved (111) 3=11312
 Ge₂Li₂CoO₈ spinel 3=5112
 Ge₂Li₂ZnO₈ spinel 3=5112
 GeRhLiO₄ spinel 3=13479
 HBO₂, α and β forms 3=13465-6
 HCrO₂, O—H—O bonds, by neutron diffraction 3=1334
 HgSe, high-pressure phase 3=3253
 H₂S 3=1325
 IF₇, orthorhombic form 3=8843
 In arsenides, lattice periods, effect of surplus In or As 3=20836
 InAs, bond length and order rel. to electron transfer 3=20044
 InAs, change on melting 3=5448
 InAs, at high pr. 3=11211
 InP, at high pr. 3=11211
 InSb, bond length and order rel. to electron transfer 3=20044
 InSb, electron density distrib. 3=11260
 InSb, at high pr. 3=11211
 InSb, high-pressure phase 3=20834
 InSb, high-pressure phase, exptl. confirmation 3=13516
 InSb, metallic form 3=13517
 InSe, amorphous, short-range order meas. 3=13515
 InSe, rhombohedral 3=13459
 IrSb₂ 3=13518
 KB₂O₈·4H₂O 3=13477
 K₂B₂O₇·4H₂O 3=25724
 β -K₂Bi 3=20841
 KCoF₃ 3=1332
 KCuCl₃ 3=18314
 KD₂PO₄, lattice constants 3=17943
 KFeF₃ 3=1332
 KH₂F₃, geometry of H₂F₃⁻ ions 3=8847
 KICl₄·H₂O, refinement 3=13476
 KI·Hg(CN)₂ 3=8855
 KHgBr₃·H₂O, X-ray diffr. study 3=18315
 KMnF₃ 3=1332
 K₂[NH(SO₃)₂] 3=25723
 K₂NbO₃F 3=3306
 KNiF₃ 3=1332
 KO, by X-ray powder diffr. 3=16071
 (KPO)_x, by generalized Patterson function 3=18323
 LaAlO₃, Ga³⁺ e.s.r. data 3=11112
 LaC₂ 3=1328
 La₂C₃ 3=1328
 La₄Co₄(NO)₁₂·24H₂O, from mag. susceptibility 3=8867
 La₂Ge₃ 3=8842
 Li₂C₄, unit cell, space group, X-ray diffrn. 3=6843
 LiCrGeO₄, tetrahedral coord. of Li 3=13175
 LiCuCl₂·2H₂O 3=25719
 LiF, lattice parameter changes, rel. to cold working 3=8838
 LiK₂P₂O₈·H₂O 3=8858
 LiNbO₃, by powder neutron diffr. 3=23454
 Li₂SO₄·H₂O 3=18070
 LuC₂ 3=1328
 Mg ferrite, nonstoichiometric, cation distribution 3=25720
 Mg(D_{0.4}H_{0.6})₂ 3=13457
 Mg(G₂₋₃Mn)₂O₄, cation distrib., by X-ray dispersion, anomalous 3=13486
 Mg₂Ge_xSi_{1-x}, 250°-600° K, meas. 3=13142
 MgSO₄·H₂O 3=18327
 MgS₂O₇·6H₂O 3=25721
 MgZn ferrite 3=23184
 Mn ferrite, lattice constants variations 3=3304

Crystal structure, atomic — contd**inorganic compounds — contd**

- Mn(III) trioxides of heavy lanthanides and Y 3=25722
 Mn uranate 3=3320
 MnCr₂O₄, mag. structure, neutron diffr. data 3=11101
 Mn_{2-x}Cr_xSb, X-ray study 3=13282
 Mn_{1.03}Fe_{1.97}O₄, crystal structure 3=13463
 MnO₂, γ - β transform. 3=23376
 MnOOH, hydrogen position detm. by neutron diffraction 3=1335
 MnSO₄·H₂O 3=18327
 MoBe₂₂ 3=20839
 Mo₂C, neutron-diffraction determ. 3=11264
 MoCl₃ 3=13464
 MoS₂, rhombohedral 3=13459
 mX²⁺·O·UO₃·nH₂O, general structural formula 3=3305
 Na tetraborate hydrates, n.m.r. study 3=8739
 NaBePO₄, beryllonite 3=13472
 (Na_{0.5}Bi_{0.5})/TiO₂ 3=20851
 NaBO₂ 3=18322
 NaBr·2H₂O, and proton structure 3=6851-2
 NaCl, structure amplitudes, high (sin θ)/ λ 3=13454
 NaCl—CaCl₂ solid soln., pptn. from 3=20840
 NaClO₅·5H₂O 3=3300
 Na₂CO₃·NaHCO₃·2H₂O, proton positions by n.m.r. 3=8859
 Na₂CO₃·10H₂O, Na₂CO₃·7H₂O, by X-ray diffr. 3=20854
 NaF films, electron diffr. study 3=25680
 Na₂H₂[Mn^{IV}(IO₃)₂]·17H₂O 3=23460
 [Na₂H(PO₃)₂]₂ 3=1337
 NaNbO₃, field-induced ferroelec. phase 3=8853
 NaNbO₃—KNbO₃, three phases 3=8853
 Na(Nb_{1-x}Ta_x)O₃, transitions 3=13394
 NaNbO₃, ferroelectric phase transition 3=13397
 NaNO₂, X-ray and neutron diffr. study 3=1336
 (NaPO₃)_x, Kurrol type B salts 3=18321
 (NaPO₃)_x, Maddrell's salt 3=16079
 Na₂SO₃·10H₂O, Na₂SO₃·7H₂O, by X-ray diffr. 3=20854
 Na₂S₂O₈·2H₂O 3=8848
 NaYF₄, and transformation, 670° C 3=23455
 Na₅Zr₂F₁₃, X-ray diffr. study 3=18315
 Na₂Zr₂Si₂O₂₂, vlasovite 3=13474
 2Nb₂O₅·Ta₂O₅, unit cell and space group 3=5111
 Nb—Ru alloys 3=22662
 Nb₂Si, pseudo-f.c.c. 3=13514
 NbSn_n, supercond. 3=5592
 NH₄ halide phosphors 3=23100
 (NH₄)₂BeF₆ 3=16082
 NH₄BeF₆ 3=20847
 NH₄Cl, I = II transitions, X-ray study 3=6810
 NH₄ClO₄ 3=8852
 NH₄ClO₄, NH₄ ion orientation 3=8857
 NH₄CuCl₃ 3=18314
 (NH₄)₂WS₄ 3=25716
 Ni films, chemically precipitated 3=5013
 Ni hydride, f.c.c. lattice, H atom positions 3=25709
 Ni²⁺ site preference, effect of anion charge compensation 3=18222
 Ni₃C, electron diffraction study 3=1324
 Ni(H₂O)₆SO₃ 3=1339
 NiMoO₄ 3=5110
 Ni(NO₃)₂·4H₂O, unit cell and space group by X-ray diffr. 3=16084
 NiO, antiferrimag., by electron diffr. scatt. polarized 3=18111
 NiO, temp. factors 3=23444
 Ni₂O 3=18264
 NiO·Cu 3=8856
 NiO·Na 3=8856
 NiSO₄·H₂O 3=18327
 Ni₂TiX, CsCl-type structure 3=1344
 Ni₂ZrAl, CsCl-type structure 3=1344
 PbBi₄Te₇, electron diffr. study 3=13510
 PbBi₄Te₇, electron diffraction analysis 3=6838
 Pb₂MgWO₆ 3=23459
 Pb₂MgWO₆—PbTiO₃ solid solutions 3=23459
 PbO₂, tetragonal, oxygen parameter 3=1329
 PbTiO₃—BaZrO₃ system, X-ray study 3=13481
 PbTiO₃—LaFeO₃ system, modifications, by X-ray diffr. 3=20852

Crystal structure, atomic — contd inorganic compounds — contd

- Pb₂TiP₂O₈ 3=10982
 Pb₂ZrAs₂O₈ 3=10982
 Pb₂ZrP₂O₈ 3=10982
 Pm sesquioxide, from X-ray powder reflections 3=18311
 Pr oxides, rel. to dipole relaxation 3=8552
 Pr₂C₃ 3=1328
 Pr(NO₃)₃·6H₂O 3=18326
 PtBi 3=18332
 PtBi₂ 3=18332
 Pu nitrides and sulphides 3=16473
 R₂Mg₂₃ compounds 3=18313
 R₂Ni₁₁Si₇ compounds 3=18313
 RbBeF₃ 3=20847
 RbBe₂F₅ 3=13484
 α-RbBi₂ 3=13518
 RbSb₂ 3=13518
 ReAl₄, X-ray meas. 3=5115
 ReBe₂₂ 3=20839
 Rh—Al (36.5–99.92 at.%), lattice spacings 3=18339
 Rh₁₇S₁₁ 3=8841
 Ru₄Be₁₇ 3=8839
 S₂N₄ 3=25712
 Sc₂Ge₃ 3=8842
 Sc₂O[SiO₄] 3=13485
 ScP 3=11258
 Sc₂Si₃ 3=8842
 Sc₂Si₂O₇ 3=13485
 SiC, polytypes, anomalies 3=11212
 SiO₂·3CaO, polymorphism 3=3301
 Sn sulphide, from films heated at 425°C 3=1327
 SnBr₄ 3=18317
 SnCl₂ 3=5103
 SnI₄—S₈ 3=13475
 SnO₂Cu 3=8856
 SnO₂Na 3=8856
 SnTe, meas. rel. to stoichiometry 3=6604
 Sr₂FeTaO₈, phase transform. at 250°C, X-ray study 3=18226
 Sr(GeO₃), as model for Ca(SiO₃) 3=18316
 SrGeO₃, electron density projection plot 3=23456
 Sr₂Li₂₃ and Sr₂Li₃ 3=11266
 Sr₂Mg₁₇ 3=20837
 Sr₂Mg₁₇ 3=20838
 Sr(NiW)₁₁O₁₀, phase transitions 3=8864
 Sr₂ZrAs₂O₈ 3=10982
 Sr₂ZrP₂O₈ 3=10982
 SrZrS₄ 3=8850
 TbC₂ 3=1328
 Tb₂C₃ 3=1328
 TcAl₆, X-ray meas. 3=5115
 Tc₂(CO)₁₀, unit cell and space group 3=3299
 Th nitrides and sulphides 3=16473
 Th₂Al—H and —D, by neutron diffr. and p.m.r. 3=20849
 Th₂Al—H system, by X-ray diffr. 3=20848
 Th₂Al₄H₈, order or disorder of H 3=20768
 ThO₂, by neutron diffraction meas. 3=20844
 ThO₂, thermal atomic motions up to 1100°C 3=20845
 Th₂P₄ type, as polyhedra arrangement 3=23450
 TlBiSe₂ films 3=20850
 TlI₃, unit cell dimensions and isomorphism with NH₄I₃ and CsI₃ 3=11263
 TiC₂ 3=1321
 TiCl₃ 3=16076
 Ti₂Ni, correction 3=8845
 Ti₂O₃, mag. structure, neutron diffr. meas. 3=15862
 TiO₂Cu 3=8856
 TiO₂Na 3=8856
 U carbides, interatomic distances 3=20843
 U minerals, space group 3=11271
 U nitrides and sulphides 3=16473
 UC₂ 3=1328
 UC₂ (tetragonal) and U₂C₃ (cubic), geometrical relationship 3=3324
 UO₂, by neutron diffraction meas. 3=20844
 UO₂, thermal atomic motions up to 1100°C 3=20845
 γ-UO₂ 3=25713
 U₃O₈ oxygen-deficient, "out-of-step" 3=811

Crystal structure, atomic — contd inorganic compounds — contd

- WBe₂₂ 3=20839
 W nitride II, rhombohedral, chemical crystallog. 3=20842
 W₃N₈ films, rhombohedral, 3=13460
 W—N system, superlattice and disordered phases 3=23451
 WO₃, colloidal 3=18408
 W_xTa_{1-x}Se₂, x = 0.10–0.99, X-ray study 3=23029
 XeF 3=16073–4
 XeF₄ 3=16073, 16075
 XeF₄ 3=6846
 XeF₄ 3=12844
 XeF₄, monoclinic phase 3=23452
 YC₂ 3=1328
 Y—Eu garnets 3=3124
 YFe garnet, refinement 3=8834
 YH₃ and YD₃ 3=17658
 YI₃, lattice constants 3=25714
 YMnO₃ 3=25722
 YP 3=11258
 YbC₂ 3=1328
 Zn, calc. from first princs. 3=8395
 (Zn, Cd)S : Cu phosphors, X, γ-ray effects 3=23457
 ZnO, crystallographic polarity 3=11259
 ZnO, high-pressure polymorph 3=3254
 7ZnO.Sb₂O₃ 3=3274
 ZnP₂, tetragonal and monoclinic 3=16072
 Zn₃(PO₄)₂, γ-phase 3=6849
 ZnS:Cu, incorporation of Cu rel. to luminesc. 3=10996
 ZnS:Cu, Cl, and electroluminescence 3=23123
 ZnSe, hexagonal modification 3=16070
 ZnSnAs₂, chalcopyrites or zincblende? 3=11267
 ZnSO₄·H₂O 3=18327
 ZrO₂ films meas. 3=8577
 ZrO₂—CaO, fluorite phase 3=25728
 ZrO₂, tetragonal 3=6845
 Zr—Ti—O long range ordering 3=3289
- ## organic compounds
- adenosine-5'-phosphate 3=8871
 anthracene, X-ray diffrn. patterns 3=20859–60
 anthraquinones, substituted 3=23462
 cadmium bromide dipyrindate, by X-ray diffraction 3=6854
 cathrate hydrates, tri n-butyl sulphonium fluoride hydrate 3=3309
 clathrate hydrates, tetra n-butyl ammonium benzoate hydrate 3=3308
 cyanogen 3=25729
 cyclo-octatetraene complex with Fe tricarbonyl 3=2643
 cytosine monohydrate (C₄H₇N₃O₄·H₂O) 3=8868
 δ-benzene hexachloride, bond angles, nucl. quadrupole resonance study 3=8872
 3, 5- dibromo para-amino benzoic acid 3=13490
 formate dihydrates, monoclinic 3=25730
 graphitic oxide 3=18331
 imidazol 3=18329
 methyl ammonium alum, dimorphism 3=1342
 1, 8-dihydroxy anthraquinone 3=13491
 1-methylthymine 3=8869
 pentacene, bond lengths 3=1341
 pentaerythritol, effect of high press. on lattice parameters 3=3252
 poly-γ-methyl-L-glutamate, Pauling—Corey α-helix detrm. 3=6838
 polyacrylonitrile 3=11276
 polymers, crystalline and paracrystalline order 3=11275
 polyethylene crystals, folding of mols. 3=11274
 rare earth hydrated perchlorates, dioxane addition 3=20861
 rubber, natural, spherulites in thin films 3=1343
 tetracene, bond lengths 3=1341
 tetramethylammonium mercury tribromide [N(CH₃)₄HgBr₃] 3=13488
 thiourea, low-temp. ferroelec. phase 3=18330
 urea 3=3310
 urea ammonium bromide 3=13487
 vitamin-A acid, triclinic 3=8870
 (CH₃)₂S.HgI₂ 3=16087
 Cu phthalocyanine, atomic spacing 3=11248
 Cu(C₆H₅COO)₂·3H₂O 3=11273
 KF·2Al(C₂H₅)₃ 3=11272

Crystal structure, atomic — contd**organic compounds — contd**

- Mn₂(CO)₁₀ 3=13489
Rb tetraphenylboranate 3=20862

Crystallization

- See also Crystals, growth; Heat of crystallization.
alloys, in unsteady-state conditions, two-phase zone 3=21623
 α -Fe, recrystallization, effects of C added 3=23484
coprecipitation in mixed crystal formation 3=1275
eutectics, binary, lamella-rod transition 3=25758
eutectics, nucleation, rel. to structure 3=13503
ice, on aeroplanes, in clouds 3=18252
ice, effect on subsequent thermoluminesc. 3=13649
ice, nucleating activity of materials 3=1273
ice, nucleation by monodisperse NaI 3=8806
ice, in a supercooled aerosol stream, on models, struct. 3=18252
liquid, nucleus size, by u.s. velo., anomalous increase 3=18251
melt, as order-disorder transform., imperfection reduction 3=20790
melts, nonadiabatic, one-dim. analysis 3=21625
new phase nucleation centres, pressure effect 3=25663
nucleation by crystalline particles 3=7394
nucleation, volumetric hindrance 3=1272
polychlorotrifluoroethylene, spherulitic, with chain folds 3=3272
polyethylene, n.m.r. and dilatometric studies 3=11232
polymers, degree of crystallinity det. 3=11308
polymers, high, kinetics, study techniques 3=11234
polymers, sequence selection 3=11233
quartz, amorphous, on heating in H₂ 3=20917
rubber, kinetics, hydrostatic press. depend. 3=23421
secondary recrystallization, in polycrystals, with macroscopic pores 3=3336
spherulitic, phenomenological theory 3=23390
spodumene, Raman spectra 3=5086
statistics of random placement on linear lattice 3=9357
supercooled binary alloys 3=21624
two-component system, zone, analysis 3=25675
water of, loss, exo-electron emission during 3=5689
waves in supercooled phosphorus 3=9658
AgCl, precipitation kinetics meas. 3=18270
Al, effect on substructure 3=23463
Al, recrystallization and grain-boundary motion, effect of He 3=11222
Al, recrystallization, of annealed dendritic single crystals 3=3335
Al-Mg-Si sheet, recryst., effect of heat treatment 3=6869
BaSO₄, in aqueous solution 3=16040
Bi, from melt, effect of elastic vibr. 3=18248
Bi, solid-liq. front oscillation conditions 3=25664
Bi₂Se₃, from liquid, monotectic reaction 3=16107
Cd, evaporated metal, in vacuum 3=16036
Cd(OH)₂, films, thin, by electrolysis, kinetics 3=16170
CdS films, recrystallizing technique 3=23396
CdS 3=18258
Cr ferrite, recrystallization, effect of alloying elements 3=20900
Cr, impurity phases distribution 3=15485
Cr, recrystallization embrittlement process 3=16005
Cu, epitaxial, electrocrystallization, imperfections 3=23415
Fe, cold-rolled, primary recryst. texture 3=18353
Fe-Co alloys, ordering, recrystalliz. 3=11296
Fe-Ni 50/50% alloy, recrystallization, rel. to grain size and impurities 3=16112
Ge-Al-Sb, equilibrium, heterogeneous, Al-Sb interaction 3=20902
InAs-GaAs system, complete phase diagram 3=16120
KIO₃, in presence of 10-14% HIO₃ 3=23405
NaCl "Morphodrome" from phase diagram 3=16042
Ni, collective recryst., grain growth kinetics 3=20904
Ni, recrystallization centres, growth kinetics 3=20794
Ni-C, crystallization, effect of Bi, Ca, Li impurities 3=15115
Ni-Mo alloy, collective recryst., grain growth kinetics 3=20904
Ni, on Si, hexagonal 3=25666-7

Crystallization — contd

- Ni-Ta alloy, collective recryst., grain growth kinetics 3=20904
P₂O₅, kinetics 3=23420
PbSO₄, from soln., effect of additives 3=23402
Sb, from melt, effect of elastic vibr. 3=18248
Si-Fe, deformed, substructures and recrystallization 3=23468
Sn, nucleation catalysis in supercooled liquid 3=1270
Sn, surface recrystallization, effect of Na and Zn traces 3=3334
Te-Ge amorphous alloy, dendrite growth 3=1266
W crystals grown by recrystallization 3=13541
W, recrystallization kinetics 3=3333
Zn, evaporated metal, in vacuum 3=16036
Zn, recryst. obs. in deformed plate 3=23407

Crystallography

- See also Electron diffraction crystallography; Neutron diffraction crystallography; X-ray crystallography.
acentric unit cell with heavy atom, intensity analysis 3=23429
atomic parameters refinement by direct calc. of minimum residual 3=25701
AX₂ structure types, two groups 3=23423
black white groups of infinite ribbons 3=16052
black-white point groups, complete systematics 3=20807
Bragg scattering, rel. to parametric amplification 3=5886
cube varieties 3=23379
diffraction, dynamical theory rel. to small distortions 3=13576
dimer problem in rectangular lattices 3=6447
etchants for CdSb and ZnSb surface preparation 3=13407
ferromagnetism and ferroelectricity, simultaneously, point groups 3=18069
finite strips, symmetry and antisymmetry groups 3=18232
hexagonal system, angle data 3=5093
image-seeking method, review 3=1317
inequalities, 4th and higher order 3=18286
limit point groups, of double antisymmetry 3=20809
limits law, and closest packing principle 3=13427
macroscopic symmetry in space-time and magnetic point groups 3=23366
mathematics, Delaunay algorithm transform. for parallelepiped quadrilateral figure 3=18231
micas, diffr. props. rel. to diagnostic props. 3=13482
phases det. by linear eqns. between structure factors 3=25702
point groups expressed as semi-direct products 3=1276
point symmetry groups and antisymmetry types, tables 3=23424
proteins, Fourier functions 3=20811
rigid-body groups of atoms, least-squares refinement 3=18303
screw dislocations, displacement field, X-ray scatt. 3=2806
Shubnikov antisymmetry groups, derivation from 230 Fedorov groups 3=20808
single isomorphous-replacement method, heavy atom config. 3=2290
space group O_h, representation 3=16051
structure factor amplitudes calc. 3=8830
structure factor for harmonic oscillator 3=11256
symmetry adapted functions of groups 3=8797
symmetry centre and structure factors, computer programmes 3=18300
symmetry groups, attribution to three dimensional groups in all cases 3=23422
symmetry of Fourier space 3=8816

Crystals

See also Liquid crystals.

- acoustic axis, calc. 3=22655
acoustic paramagnetic resonance in S-state ions 3=2725
alkali halides, Born-Meyer potential function 3=17628
Born-Meyer potential function, modification 3=17628
cutting, high precision, for spectrometer 3=20821
dielectric, thermal conductivity, without umklapp processes 3=25208
 γ - γ correlation, perturbed by hyperfine interaction in crystals 3=10245
electron diffraction after single plasmon loss 3=10641

Crystals — contd

- e.m. wave spatial dispersion 3=15644
- forms, graphic description 3=13402
- hydrate crystals, H_2O flip motion, n.m.r., first and second moments effect 3=23268
- luminescence, book monograph 3=6664
- mechanical strength, review 3=25626
- metal single, machining and cutting 3=8814
- metallic, cubic symmetry, elasticity theory 3=13322
- n.m.r., high resoln. meas., rotation technique 3=14791
- nuclear spin diffusion rel. to diffusion barrier 3=7664
- on photographic film, colour, after several years 3=14386
- optic axes, circular 3=23033
- polar, ferroelectricity and antiferroelectricity 3=15615
- polar, secondary-electron escape mechanism, theory 3=2021
- polarization of ferromag. nuclei in paramag. or diamag. crystals 3=6686
- polarized bremsstrahlung on electron incidence 3=5980
- polymers, partially crystalline, degree of crystallinity 3=11308
- powders, organic, Raman spectra, compared with solutions 3=6650
- semiconductors, magnetoelectric and thermomagnetoelectric effects, calc. 3=6565
- tensor non-linear relations, anisotropic 3=22619
- vapour pressure formula, for $T \approx \Theta$ 3=5557
- vapour pressure, monatomic 3=14428
- Vlasov equation for density variation 3=17639
- KCl, Born repulsive energy 3=2690
- NaCl, Born repulsive energy 3=2690

electron states

See also Colour centres.

- acoustic amplific., resonant, by cond. electrons 3=20093
- alkali metals, effects of electron correls. 3=12947
- alkali metals, Fermi surfaces calc. 3=6490
- alkali metals, nonlocal correl. effect 3=20137
- alloy, charge polarization near impurity 3=8380
- alloys, binary orderable, energy splitting, calc. 3=17688
- alloys, dilute, anisotropy effects 3=8388
- alloys, dilute, Fermi surface, density matrix theory 3=22700
- alloys, dilute, from transport props. 3=8382
- alloys, electron overlap across Brillouin zones 3=8874
- alloys, rel. to size effects, chemical interactions, compressibility 3=22757
- alloys, rigid-band model 3=8391
- anthracene, excess defect electrons, density of states 3=4844
- antiferromagnets, metal-insulator transition, energy band theory 3=10729
- band electrons, magnetic behaviour 3=986
- band structure, composite wave variational method 3=25237
- bipolarons, in ionic crystals 3=4849
- Bloch electrons, overlap integrals 3=22684
- Bloch functions, integrals, selection rules 3=6484
- Bloch-Wannier functions, for nondegenerate bands 3=780
- Boltzmann transport eqn., gen. soln. and boundary-val. probs. 3=4847
- Boltzmann transport eqn. in elec. and mag. fields 3=25226
- at boundaries, impurities, structural defects, calc., analogue 3=17681
- carrier drift instability, rel. to coherent phonon emission 3=4821
- conduction electron-phonon interacts. 3=22675
- conduction electrons, Boltzmann eqn. 3=25227
- conduction, formation on F^+ -centre photoionization 3=20243
- corundum, anisotropic spin-orbit coupling of d^3 and d^4 solutes 3=2694
- covalent crystals, electron transitions due absorbed e.m. waves 3=15661
- cubic diamond-type, valence and conduction band structure 3=10618
- diamond, conduction band, plane-wave calc. 3=777
- diamond, excited states, many-electron model 3=778
- diamond, single interstitial atoms 3=10620
- diamond, using free-electron network model 3=12939
- diamond, valence and cond. bands 3=20135
- diamond, valence band, l.c.b.o. method 3=779

Crystals — contd

electron states — contd

- diamonds, single vacancies 3=786
- dichromates, vibr. structure of bands, origin 3=4837
- dielectric const. including local field effects 3=4937
- dynamics in elec. and mag. fields 3=4834
- effect of ultrasound on energy spectrum 3=15459
- electric cond. theory and hot electron problem 3=824
- electron beam energy losses in 32 cpds. 3=2780
- electron gas, degenerate, dielec. const. 3=7146
- electron-hold field, interact. with phonons 3=751
- electron-hole scatt., solids with band-gap impact ionization 3=25222
- electron-lattice states of low energy, props., rel. to superconductivity 3=332
- electron-lattice systems, strongly coupled, motion 3=10587
- electron lattice, zero-energy point 3=12941
- electron-phonon system, elec. conduct., quantum statistical calc. 3=6468
- electron scatt., inelastic, excitation theory 3=15479
- electron scatt., small-angle inelastic, theory 3=4856
- electron transmission and reflection energy loss spectrum 3=20151
- electronic band structure 3=25430
- electronic excitation transfer and relaxation 3=10619
- e.m. wave theory rel. to exciton dispersion 3=6499
- energy degeneracy in mag. field 3=17686
- energy gaps due to screw-type spin ordering 3=15465
- energy spectrum calc. methods, review 3=4843
- energy spectrum of impurity bands in disordered solid solns. 3=25242
- even-valence metals, Fermi surface "necks" 3=25243
- exchange energy of electron gas 3=15474
- external elec. and mag. fields, approx. calc. 3=2751
- Fermi level, basic concept in teaching 3=341
- Fermi level det. from X-ray emission bands 3=4838
- Fermi surface, from quantum resonances in acoustic amplification 3=20094
- Fermi surface in form of a net; open electronic orbits in mag. fld. 3=2754
- Fermi surface, interacting fermion systems, t-matrix 3=75
- Fermi surface mapping by magneto-acoustic resonances 3=17680
- Fermi surface, point by point mapping 3=12948
- Fermi surface study by magnetothermal oscillations 3=2743
- Fermi surfaces in form of net 3=12943
- ferric acetylacetonate, zero-field energy levels 3=23228
- ferromag. anisotropy band theory 3=979
- ferromagnetic metals, low-lying energy levels 3=20564
- ferromagnetic, polarized cond. electrons, shear on Fermi surface 3=6489
- IV-IV and III-V cpds., many-electron model 3=778
- gaps, in disordered structure, possibility 3=20128
- garnets, model, rel. to indirect spin coupling 3=5021
- group IV elements, orthog. plane wave method 3=10625
- hard-metals, refractory, band structure 3=10567
- Hartree-Fock approx., perturb. method 3=3754
- helicon oscillations, classical theory 3=10728
- hopping motion, thermally activated, model 3=6500
- ideal crystals, energy bands 3=10715
- impact ioniz. of centres by electrons 3=8502
- impurities in metal, virtual bound levels 3=8392
- inert gases, ground-state energy, Hartree calc. 3=320
- insulators, collective excited states 3=2944
- interface, with adsorbed gas, two semi-infinite one-dimensional crystals 3=25238
- intermetallic cpds, tetrahedral, rel. to localized mol. orbital bonds 3=776
- ionic, polar scatt., in magnetoconduct. 3=15464
- ionization of local levels by elec. field 3=15453
- lattices containing impurities, density of states 3=2760
- levels, inverse population, negative absorpt. coeff. 3=4787
- ligand field spectrum, cubic, three-electron 3=25166
- luminescence, signs of charge carriers, meas. 3=10979
- many-phonon transitions, theory 3=6485
- metal, electron momentum meas. 3=6496
- metal, electron-phonon system, kinetic eqns. 3=25249

Crystals — contd

electron states — contd

- metal films, plasma resonance due to fast electron 3=8407
- metal foils, surface energy, thickness depend. 3=10573
- metal, Green's function, and spectrum analysis 3=2745
- metal in multiple mag. fields, size effect 3=842
- metal in multiple mag. fields, size effect 3=8493
- metal, monovalent, cond. electrons scatt. 3=8384
- metal tungsten bronzes, model for electronic structure 3=15461
- metals and alloys, rel. to n.m.r. 3=23245
- metals, and bond strength interatomic 3=20045
- metals, conduction electrons, sound atten. 3=10593
- metals, conductivity electrons, momentum, meas. 3=4835
- metals, determ. 3=25218
- metals, diamag. shielding of nuclei, theory 3=2750
- metals, effect of Coulomb correl. on electron gas 3=15466
- metals, elastic consts. rel. to temp., electron contrib. 3=25603
- metals, electron density rel. to elasticity theory 3=5053
- metals, electron energy loss for fast nonrelativistic electrons, theory 3=4855
- metals, electron-phonon, freqn.-depend. relax. 3=25250
- metals, electronic structure, from first princs. 3=2394
- metals, electronic structure of defects, effects of 3=8389
- metals, Fermi energy of cond. electrons, student meas. 3=25263
- metals, Fermi surface rel. to mag. ground state 3=3094
- metals, Fermi surface, review 3=10594
- metals, functional variational principles 3=752
- metals, interaction, rel. to paramagnetism 3=15756
- metals, kinetic eqn., many-phonon corrections 3=15454
- metals, localized d states, many-body theory 3=20136
- metals, magnetoplasma oscill. for anomalous skin effect 3=8411
- metals, magnetoplasma reson., i.f., meas. 3=8409
- metals, microcharacteristics, meas. by optical constants 3=15467
- metals, monovalent, electron scatt. by localized perturbing potl. 3=8385
- metals, nuclear spin coupling, exchange-type 3=5360
- metals, one-electron states, phonon interact. 3=10588
- metals, point defects, electronic structure 3=8390
- metals, quantum magnetoacoustic effect rel. to electron spin 3=15429
- metals, range of hot electrons, theory 3=15462
- metals, rel. to magnetic order 3=15406
- metals, spin-lattice relax., electron-electron interact. effect 3=23266
- metals, static skin effect, in strong mag. field 3=25223
- metals, surface collisions, Fermi liq. theory 3=25245
- metals, surface double layer, dipole moment 3=15470
- mixed crystals, excited states 3=4841
- motion in mag. field, Wannier functions, phase choice 3=25224
- naphthalene, hole mobility, calc. 3=20339
- noble metals, Fermi surface 3=8915
- noble metals, Fermi surface dimensions, from magnetoacoustic effect 3=2759
- noble metals, redistrib. by point defects 3=15463
- noble metals, relaxation time of conduction electrons 3=25228
- nonmetallic system, low-density, perturb. theory 3=25239
- nonmetals, light absorption by cond. electrons, elec. field effects 3=4967
- nonradiative transitions in local centre, theory 3=15455
- one-electron states of imperfect crystals 3=8399
- org. phosphorescing cpds., 35 cpds. 3=958
- organic, π -electron, triplet state interaction matrix element 3=3058
- paramag. ion in lattice, ground-state 3=15410
- paramagnetic crystals, rel. to spin-lattice relaxation 3=3182
- paramagnetic spins in lattice, for nuclear spin cooling 3=19077-8
- periodic potential with defect, one-dim. 3=21238
- phonon-electron system, coupled, field theory 3=20084
- photon-induced electronic transitions in molecular crystals 3=10711

Crystals — contd

electron states — contd

- phthalocyanine, applicability of band model 3=22680
- phthalocyanine, metal-free, conduction band 3=10890
- plasma, drifted, transverse e.m. wave propag. 3=17693
- plasmas, helical instabilities, theory 3=8410
- plasmon frequency, dispersion coeff. 3=6501
- plasmons, absorption of e.m. waves 3=2771
- plasmons interact. with radiation 3=12952
- polar crystals, slow-electrons 3=4850
- polar semiconductors, impurity states, many-particle theory 3=4846
- polarons, in optical absorpt. theory 3=13162
- polarons, small-radius, rel. to elec. conductivity 3=15528
- radiation effects, review 3=2841
- radiationless transitions, non-Condon approximation 3=2747
- Raman spectra, observation possibility 3=8588
- rare earth hexaborides, data analysis 3=10763
- rare earth metals, 4f shells, indirect interact. 3=3076
- rare-earth metals, heavy, Fermi surfaces and spin structures 3=22687
- rare-earth metals, indirect exchange interactions 3=10642
- rare earth metals, virtual bound state model 3=2756
- rare earth monoselenides, model 3=20131
- rare earth monosulphides, model 3=20131
- rare earth, monotelurides, model 3=20131
- recombination and capture, little electric field effect 3=20126
- recombination and capture 3=20125
- redistribution by point defects, theory 3=15480
- ruby, Cr^+ radiationless transitions 3=15456
- second harmonic generation, theory 3=12935
- semiconductor carrier lifetime, meas., by microwaves, high cond. 3=20296
- semiconductor, degenerate, phonon interaction 3=20129
- semiconductors, crystal potential and energy bands, exchange and correlation effects 3=6578
- semiconductors, CdS-type, trapping level parameters meas. 3=25231
- semiconductors CdSb, ZnSb, extremal points, dispersion 3=17684
- semiconductors, band structure, photoemission investig. 3=20318
- semiconductors, degenerate 3=20454
- semiconductors, donor, relax. by spin-orbit interact. 3=25219
- semiconductors, effects of neutron-irrad. defects 3=25336
- semiconductors, electron temp. fluctuations and noise, high fields 3=17835
- semiconductors, Fermi level calc. 3=20293
- semiconductors, impure, perturb.-moment method 3=22683
- semiconductors, impure, Thomas-Fermi approach 3=17678
- semiconductors, from i.r. spectra at low temps. 3=15667
- semiconductors, local-centre parameter meas. photoelectric 3=20295
- semiconductors; optical and magneto-optical effects as examination tools 3=2994
- semiconductors, optical and nonradiative transitions 3=23032
- semiconductors, zinc-blende type, Fermi level, surface, rel. to band gap 3=20134
- space group D_{2h}^{15} , extremal points, dispersion 3=17684
- spectra, narrow-line, thermal broadening 3=2697
- space group \mathcal{O} , representation 3=16051
- spinel, vanadium, rel. to interatomic distance 3=12934
- splitting of levels by crystal field 3=15458
- spin paramag. of electron gas in lattice 3=8381
- superconductors, lattice-electron interact. 3=5580
- surface potl. barrier models 3=15471
- surface states, rel. to electron scatt. in solids 3=8404
- trapping level meas., electrical 3=20326
- trapping levels, fast, meas. from photocond. 3=17846
- Teflon, positronium decay, meas. 3=10636
- thin films, cathodoluminesc. analysis 3=11004
- thiocyanate complexes, ion orientation in lattice 3=3012

Crystals — contd

electron states — contd

- III-IV cpds., orthog. plane wave method 3=10625
- III-V cpds., valence band structure 3=2753
- transition metal alloys, localized electron spins 3=8393
- transition metals and alloys, impurity atoms 3=2755
- transition metals, chromium group, band structure 3=6492
- transition metal compounds, localization of empty 4p orbitals 3=25175
- transition metals, superconducting, d electrons 3=7405
- transport processes, quantum theory 3=12938
- transport props., h.f., frequ. depend. 3=12937
- transverse conductivity, zero-freq. limit 3=4848
- two interacting systems, elementary excitation spectrum 3=2744
- II-IV cpds., band structure calc. 3=2752
- ultrasonic microwave interaction with electron spins 3=8351
- Van der Waals, paramag. impurities, variational theory 3=25274
- weak-binding approx. for one-dimen. "liquid" chain 3=9325
- zinc blende structure, LCAO theory, effect of bonds 3=25230
- zinc blende, using free-electron network model 3=12939
- Ag, Fermi surface, dimensions 3=6495
- Ag, Fermi surface, effect of pressure 3=8398
- Ag films, surface plasmon excitation 3=10633
- Ag halides, electronic props. and band structure 3=12940
- Ag, l.f. magnetoplasma resonance meas. 3=8409
- Ag, rel. to optical constants 3=2986
- AgBr, conduction band structure 3=8529
- AgBr, defect electron transport number 3=6487
- Ag-Cd alloys, h.c.p. ϵ and η phases 3=6856
- AgCl, capture levels 3=2964
- AgCl, electron drift mobility, 70-350°K 3=6486
- AgCl, electron mobility in high elec. fields 3=8387
- AgCl, trapping level spectrum, thermal effects 3=8397
- Ag₂Te, α and β , bandwidth 3=833
- Ag-Zn alloys, rel. to lattice spacings 3=6856
- Ag-Zn, ζ -phase stability 3=8396
- Al cathodes, tunnel, hot electron energy distrib., from emission 3=19301
- Al, effective masses rel. to de Haas-van Alphen effect 3=22693
- Al, Fermi surface for second zone 3=22685
- Al, Fermi surface, from de Haas-van Alphen effect 3=1121
- Al, Fermi surface, magnetoacoustic meas. 3=17682
- Al, Fermi surface, theory 3=17683
- Al, Fermi surface 3=20133
- Al, Fermi surface, using magnetoresistance data 3=25322
- Al, hole density per atom 3=22903
- Al, orthogonalized plane wave form factors 3=25229
- Al-Ag alloys, conduction band 3=25321
- Al₂O₃, positronium formation and dynamics 3=25264
- AlP, electron transfer 3=20044
- AlP, valence band, l.c.b.o. method 3=779
- Al-Zn alloys, conduction band 3=25321
- Ar, solid, exciton models and band gap 3=2998
- Au dilute alloys, conduction electron transfer 3=25220
- Au, Fermi surface 3=6495
- Au, l.f. magnetoplasma resonance meas. 3=8409
- AuAl₃, de Haas-van Alphen effect 3=12944
- AuCu₃, energy splitting, calc. 3=17688
- AuGa₃, de Haas-van Alphen effect 3=12944
- AuSb₃, de Haas-van Alphen effect 3=12944
- AuSn, from thermoelec. anisotropy 3=17972
- Au-Zn alloys, h.c.p. ϵ and η phases 3=6856
- Au-Zn, de Haas-van Alphen effect 3=12944
- Be, band structure and e^+ annihilation in 3=6503
- Be, Fermi surface 3=8401
- Be, orthogonalized plane wave form factors 3=25229
- Be, spin-orbit splitting calc. 3=10626
- Bi, band gap, from i.r. magnetoabsorption 3=8592
- Bi, electron transport phenomena analysis 3=25354
- Bi, ellipsoidal Fermi surfaces 3=2903
- Bi, Fermi surface models, cyclotron resonance 3=8413
- Bi, from Shubnikov-de Haas effect 3=15586

Crystals — contd

electron states — contd

- Bi, surface resistance, cyclotron resonance and quantum oscillations 3=17697
- BiIn, de Haas-van Alphen effect 3=12944
- Bi-Sb, effective masses meas. 3=15587
- Bi₂Te₃, at symm. points in Brillouin zone 3=10627
- Bi₂Te₃ 3=22939
- Bi₂Te₃-Bi₂Se₃ alloys, energy gap 3=13500
- Bi₂Te_{2.7}Se_{0.3}, doped 3=10895
- Bi₂Te₃, valence band structure in p-type 3=25240
- Bi density, conduction band 3=20322
- BN, excited states, many-electron model 3=778
- BN, valence band, l.c.b.o. method 3=779
- BP, electron transfer 3=20044
- C, pregraphitic, π electrons 3=15457
- Ca fluorophosphate, Mn²⁺ impurity 3=13168
- Ca, orthogonalized plane wave form factors 3=25229
- CaC₂ 3=1328
- CaO, 1.90 eV band 3=13169
- CaF₂: Sm²⁺, non-radiative transition calc. 3=20124
- Cd, Fermi surface from magnetoacoustic effect 3=22686
- Cd, Fermi surfaces, open cross-sections 3=17687
- Cd, l.f. magnetoplasma resonance meas. 3=8409
- Cd, spin-orbit splitting calc. 3=10626
- CdGeAs₂, band gaps 3=8518
- CdS, double acceptor levels 3=15704
- CdS, rel. to structure modification 3=8583
- CdS, trapping level meas., electrical 3=20326
- CdS trapping level meas., electrical 3=20326
- CdS, trapping levels, fast, meas. from photocond. 3=17846
- CdSb, carrier mobility, from conductivity, Hall effect, temp. var. 3=25358
- CdSb 3=17685
- CdSe, band gap 3=20327
- CdSe, rel. to structure modification 3=8583
- CdTe, band gap, temp. depend., optical meas. 3=23067
- CdTe, band structure 3=17979
- CdTe, double acceptor levels 3=15704
- CdTe, n-type, Fermi level position meas. 3=2758
- CdTe, valence band, l.c.b.o. method 3=779
- CeC₂ 3=1328
- Ce-Eu alloys, rel. to mag. props. and lattice structure 3=15757
- Ce, f electron, virtual bound state model 3=2756
- Ce_{3-x}S₄, conduction band structure 3=10628
- Co alloys, impurity effects on d-band 3=10622
- Co, Fermi surface area from n.m.r. 3=3197
- Co₂C₃ 3=1328
- Cr, 3d electrons 3=4833
- Cr, polycryst., Fermi surface area from surface meas. 3=2757
- CsAu, Fermi level 3=20328
- Cu alloys, electronic sp. hts. 3=8915
- Cu, energy band structure calc. 3=4840
- Cu, Fermi surface 3=2762-3
- Cu, Fermi surface, density of states function 3=8915
- Cu, Fermi surface, dimensions 3=6495
- Cu, Fermi surface, effect of pressure 3=8398
- Cu, Fermi surface topology 3=25329
- CuFeS₂ 3=1027
- Cu, l.f. magnetoplasma resonance meas. 3=8409
- Cu, rel. to optical constants 3=2986
- Cu, relaxation time anisotropy 3=8383
- Cu²⁺ octahedral complexes, spin inversion and e.s.r. spectrum 3=25570
- Cu₂O, energy and structure, rel. to exciton reflection spectrum 3=15650
- Cu₂O, exciton levels, transitions 3=20474
- Cu₂O, from photoconductivity, relaxation time 3=20403
- Cu₂Sb, de Haas-van Alphen effect 3=12944
- α -Cu-Zn alloys, density of states at Fermi surface 3=17660
- Cu-Zn alloys, rel. to lattice spacings 3=6856
- Er, 4f shell transitions, spectral lines 3=13182
- Fe, band structure rel. to ferromag. props. 3=8665
- Fe, conduction band, 10⁶ atms. 3=8372
- Fe, f.c.c., rel. to two spin states 3=13523
- Fe, Fermi surface area from n.m.r. 3=3197

Crystals — contd

electron states — contd

- Fe-group ion bonding in fluorides 3=15407
 Fe—Ni, f.c.c., two structures 3=20114
 Fe, 3d electrons 3=4833
 Fe₃Al, 3d electron config. of Fe atom 3=8334
 Fe—Co alloys, effect of Mn substitution 3=15784
 Fe—Co alloys, mag. moment distrib. 3=18098
 Fe—Co alloys, Mn-substituted 3=4839
 Fe—Co ternary alloys 3=3103
 Fe, internal mag. field for conduction electron in de Haas—van Alphen effect 3=20558
 Fe₃N, mag. structure, by X-ray scatt. 3=8846
 FeS₂, Brillouin zone, wave vector groups 3=12949
 GaAs, doping behaviour of Se, model 3=12942
 GaAs, effective mass, depend. on density 3=17885
 GaAs, effective mass, Fermi energy, from absorpt., light 3=23070
 GaAs, effective mass, from Faraday effect, i.r. 3=17986
 GaAs, electron transfer 3=20044
 GaAs, laser action due to energy-band transitions 3=4966
 GaAs, valence band, l.c.b.o. method 3=779
 GaSb, band structure, possible laser action 3=17913
 GaP, valence band, spin-orbit splitting 3=20478
 GaP_xAs_{1-x} alloys 3=20477-8
 GaS, optical absorpt. edge, energy gap 3=10946
 GaSb, electron effective mass meas. 3=12936
 GaSb, electron transfer 3=20044
 GaSb, p-type, valence band study 3=2912
 Gd—Er, localized mag. moments in elec. props. 3=13033
 Gd, f—conduction electron spin coupling 3=8400
 Gd—Lu, localized mag. moments in elec. props. 3=13033
 Gd₂O₃, low-lying energy levels 3=20105
 Ge, band structure, under high pressure 3=22682
 Ge bicrystals, grain boundary states 3=13064
 Ge, capture by deep impurity centres, negative, temp. var. 3=23017
 Ge cathode in 2 mol HCl electrolyte, surface 3=17689
 Ge, electron energy losses in thin films 3=20154
 Ge, electron scatt. at cleavage surfaces 3=4857
 Ge, etched, fast surface states 3=21854
 Ge, excess-carrier lifetime, depend. on majority density, highly doped 3=17848
 Ge, fast states, effect of water mols. 3=20138
 Ge films, electronic interact. with O₂ 3=13062
 Ge, forbidden bandwidth, carrier density depend, from diode recombination radiation shift 3=20539
 Ge, highly doped, Fermi energy 3=15679
 Ge, hole capture by Au-ions, p-type 3=17852
 Ge, hole effective masses, calc. 3=17864
 Ge, hole mobility, temp. depend., discrepancy 3=17863
 Ge, injected plasma oscillations 3=25257
 Ge, Landau levels for holes 3=8505
 Ge, n-type, electron and hole scatt., from absorpt. and vel., u.s. 3=13063
 Ge, Ni-doped, p-type, excess-carrier lifetime, temp. depend. plateaux 3=17847
 Ge, number of minima in cond. band 3=10898
 Ge, p-type, surface states in cleaved surfaces 3=6497
 Ge, shallow donors, ground state energies 3=22681
 Ge, surface levels, optical study 3=2989
 Ge, surface states, fast, temp. depend. 3=6586
 Ge, surface states, optical absorpt. 3=25251
 Ge, trapping states near valence band edge 3=22925
 Ge, valence band, l.c.b.o. method 3=779
 Ge—Si alloys, band structure, calc. 3=22682
 Ge—Si alloys, valence band structure 3=12946
 He³, ground-state energy, Hartree calc. 3=320
 Hg, i.f. magnetoplasma resonance meas. 3=8409
 Hg, positron annihil. data 3=12954
 HgTe, band structure 3=17979
 InAs, effective mass, depend. on density 3=17885
 InAs, electron transfer 3=20044
 InAs, semiconducting effective mass, 293–603°K 3=20333
 In, cond. electrons, concn. and collision props. 3=22676
 In, Fermi surface, extremal dims. meas. 3=6472
 In₂S₃, trapping centres 3=20515
 InSb, effective mass, depend. on density 3=17885
 InSb, electron–hole plasma, thermal pinching 3=25261
 InSb, electron transfer 3=20044

Crystals — contd

electron states — contd

- InSb, Fermi surface, magneto-optical data 3=10917
 InSb, hot electrons, drift velocity meas. 3=8386
 InSb, p-type, valence band structure 3=22947
 InSb, valence band, l.c.b.o. method 3=779
 K, effective mass and crit. wavelength 3=17975
 K, orthogonalized plane wave form factors 3=25229
 K, quantum light absorpt. by transitions 3=17976
 KNiF₃, covalent orbitals, n.m.r. study 3=12891
 KNiF₃, covalency, LCAO—MO model 3=12893
 Kr, solid, exciton models and band gap 3=2998
 LaC₂ 3=1328
 La₂C₃ 3=1328
 LaH, band structure 3=20671
 Li, composite wave variational method 3=25237
 Li, diamag., s—p band model 3=8638
 Li, nonlocal correl. effect of periodic field 3=20137
 Li, orthogonalized plane wave form factors 3=25229
 LiF (Cl,Br), energy losses of 30 kV electron beam 3=15478
 Li—Mg alloys, rel. to martensitic transform. 3=5125
 LuC₂ 3=1328
 Mg, band structure and e⁺ annihilation in 3=6503
 Mg, band structure and Fermi surface 3=781
 Mg, magnetic breakdown 3=20155
 Mg, orthogonalized plane wave form factors 3=25229
 Mg, spin-orbit splitting calc. 3=10626
 Mg₂Ge, by Kohn—Rostoker method 3=2752
 MgOAl₂O₃, transition metal impurity ion energy spectrum calc. 3=20130
 MgO, F- centres, spin-lattice relaxation 3=817
 Mg₂Sn, by Kohn—Rostoker method 3=2752
 MnB, covalent 2sp bonding 3=6488
 Mo, band structure by isochromat meas. 3=15468
 Mo, band structure from X-ray spectra 3=4979
 Mo, polycryst., Fermi surface area from surface meas. 3=2757
 Mo—Re alloy, b.c.c., density of states 3=3084
 Mn₂N, electron number of N atom 3=12890
 Na, composite wave variational method 3=25237
 Na, diamag., p—s—p band model 3=8638
 Na, electron mass shift calc. 3=10588
 Na, exchange energy of electron gas 3=15474
 Na halides, mag. screening of Na⁺ 3=23272
 Na, magnetoplasma resonance, satellites 3=25259
 Na, orthogonalized plane wave form factors 3=25229
 NaCl, with excess electron, wave function and energy 3=22679
 NaCl: Pb, activator absorpt. spectrum 3=940
 Nb, band structure by isochromat meas. 3=15468
 Nb, band structure from X-ray spectra 3=4979
 Nb, Fermi level, from X-ray emission bands 3=4838
 Nb—Mo alloy, b.c.c., density of states 3=3084
 Nb—Re alloy, b.c.c., density of states 3=3084
 Nb—Ru alloys, density of states 3=22662
 Nd, 4f shell transitions, spectral lines 3=13182
 Ni alloys, impurity effect on d-band 3=10622
 Ni, band structure and Fermi surface model 3=25331
 Ni, band structure rel. to ferromag. props. 3=8665
 Ni, band structure, 3d-electrons 3=25234
 Ni, Fermi surface area from n.m.r. 3=3197
 Ni, Fermi surface, multiple connectivity 3=4842
 Ni, impurity atom, d-band 3=12964
 Ni, Ni—Cu, density of states 3=23143
 NiO carrier narrow band, from Hall effect, temp. var. 3=20338
 NiO, semiconductor carrier mobilities, var. with Li impurity 3=20337
 NiO, 3d-bands 3=25235
 α-NiSO₄·6H₂O, NiSO₄·7H₂O, ground level splittings 3=8644
 O₂⁺—O₂⁺ structures, band struct., group theory 3=25232
 Pb, cond. electrons, concn., velocity and collision frequ. 3=22677
 Pb, Fermi surface, extremal dims. meas. 3=6472
 Pb, Fermi surface image in lattice vibrations 3=6467
 Pb, Fermi surface "necks", meas. method 3=25243
 Pb, Fermi surf. invest. by cyclotron resonance 3=6494
 Pb, i.f. magnetoplasma resonance meas. 3=8409
 PbS, n- and p-type band struct. 3=868

Crystals—contd

electron states—contd

- PbSe, band structure from piezoresistance 3=15592
 PbSe, effective electron mass 3=10904
 PbSe-Bi₂Se₃ system, energy gap, rel. to composition 3=25742
 PbSe, n- and p-type, band structr. 3=868
 PbSe, p-type, forbidden-band width, press. depend. 3=17889
 PbTe, band structure from piezoresistance 3=15592
 PbTe, effective electron mass 3=10804
 PbTe, n- and p-type, band structr. 3=868
 Pd alloys, binary, simple band model 3=1126
 Pd, cond. electron polariz. round mag. impurities 3=8709
 Pd, density of states 3=13228
 Pd, density of states, peak position 3=13229
 Pr, 4f shell transitions, spectral lines 3=13182
 Pr₂C₃ 3=1328
 PrCl₃, crystal-field shielding 3=17629
 PrCl₃, electronic Raman effect 3=15694
 PtSn₃, d band, Knight shift data 3=5051
 Pu, α -phase, two-band model, holes and electrons 3=17824
 Rh, and de Haas-van Alphen oscill., mechanism 3=23137
 Sb, anisotropic carriers, using magnetoacoust. reson. 3=4817
 Sb, Fermi surface tensor from cyclotron reson. 3=4851
 Sb, meas. using de Haas-van Alphen oscill. 3=4818
 Sb, pure and Sn-doped, band-doped 3=8513
 Se, carrier mobility and trapping centres 3=873
 Se, from photodepolarization, nonlinear 3=20417
 Se, states density in forbidden gap 3=13081
 Si, band gap. 3=8509
 Si bicrystals, grain boundary states 3=13064
 Si, carrier lifetime, 85-300°K, n-type 3=20320
 Si, electron energy losses in thin film 3=20154
 Si, electron-hole pair prod. by α -particles 3=17677
 Si, electron scatt. at cleavage surfaces 3=4857
 Si, heavily doped, valence band 3=15688
 Si, heavy holes, (110) swelling const. energy surface 3=25236
 Si, hole effective masses, calc. 3=17864
 Si, hole mobility, temp. depend., discrepancy 3=17863
 Si, $J = \frac{1}{2}$ valence-band edge, uniaxial strain effects 3=4797
 Si, levels of defects prod. by electron bomb. 3=6590
 Si:Li, electron irradi. effects, level spectrum of localized centres 3=22849
 Si, n and p-types, Fermi level position 3=2758
 Si, p-n, electron-vacancy pair formation energy 3=20165
 Si, p-type, electron and hole scatt., from absorpt. and vel., u.s. 3=13063
 Si, recombination at dislocations, weakened by Cu precip., O 3=20319
 Si, shallow donors, ground state energies 3=22681
 Si, spin-lattice relaxation of shallow donors 3=25221
 Si, strained, valence band structure 3=8414-15
 Si, surface states, charge storage 3=10799
 Si, surface states, from capacitance meas. 3=10801
 Si, time consts. of surface states 3=25348
 Si, valence band energy, pressure depend. 3=17646
 Si, valence band, l.c.b.o. method 3=779
 SiC, minority carrier lifetimes 3=8571
 Sm, 4f shell transitions, spectral lines 3=13182
 Sm₂O₃, low-lying energy levels 3=20105
 Sn, density distrib., directional depend. 3=1901
 Sn, Fermi surf. cross-sect. shape 3=8403
 Sn, Fermi surface invest. by cyclotron res. 3=6493
 Sn, Fermi surface, size effect study 3=25241
 Sn, grey, electronic density distrib. 3=16069
 Sn, grey, valence band, l.c.b.o. method 3=779
 Sn, l.f. magnetoplasma resonance meas. 3=8409
 Sn, mean free path and phonon interact. 3=10593
 Sn, white, band structure, perturb. calc. 3=10624
 Sn, white, empty-lattice analysis of band structure 3=4836
 Sn, white, Fermi surface from magnetoacoustic meas. 3=15469
 SnTe, overlapping of valence and cond. bands 3=25233
 SnTe, two-valence bands, evidence 3=17973
 Ta, band structure by isochromat meas. 3=15468
 Ta, band structure from X-ray spectra 3=4979
 TbC₂ 3=1328

Crystals—contd

electron states—contd

- Tb₂C₃ 3=1328
 Tb—Lu, localized mag. moments in elec. props. 3=13033
 Te, lifetime and surface recombination velocity 3=877
 Te, Fermi surface topology and magnetoresistance 3=17826
 Te, valence band structure, from magnetoolec. data 3=22953
 Th₃P₄-type, energy spectrum structure 3=22678
 Ti, electron groups, optical data 3=17977
 α -Ti, thermal electron transitions, rel. to anomalous props. 3=20127
 TiO, 3d-bands 3=25235
 Ti, Fermi surface, by magnetoacoustic meas. 3=20132
 Ti, Fermi surface, from magnetoacoustic oscill., erratum 3=10629
 Ti, Fermi surfaces, open cross-sections 3=17687
 Ti halides, ligand field theory 3=20560
 TiSe-type crystals, energy band symmetry 3=15460
 ZnTe—CdS heterojunctions, epitaxial 3=23419
 Tl, spin-orbit splitting calc. 3=10626
 UAl₃, band structure 3=8730
 UC₂ 3=1328
 V alloys with Tc, Cr, Ti, cond. band 3=3204
 V, electron groups, optical data 3=17977
 W, band structure by isochromat meas. 3=15468
 W, band structure from X-ray spectra 3=4979
 W, polycryst., Fermi surface area from surface meas. 3=2757
 Xe, solid, exciton models and band gap 3=2998
 YFe garnet, crystal field calc. for 3 sites 3=2693
 Yb, virtual bound state model 3=2756
 YbC₂ 3=1328
 Yb₂O₃, low-lying energy levels 3=20105
 YC₂ 3=1328
 Y—Lu, localized mag. moments in elec. props. 3=13033
 Zn, Fermi surface, first principles calc. 3=8395
 Zn, Fermi surface, from acoustic data 3=10623
 Zn, Fermi surface, magnetoolec. data 3=12945
 Zn, Fermi surface 3=25244
 Zn, Fermi surfaces, open cross-sections 3=17687
 Zn, l.f. magnetoplasma resonance meas. 3=8409
 Zn, spin-orbit splitting calc. 3=10626
 ZnO, double acceptor levels 3=15704
 ZnO:Li, u.v.-induced centre, e.s.r. 3=13310
 ZnS, double acceptor levels 3=15704
 ZnS, forbidden band width and effective charge 3=10621
 ZnS, forbidden bandwidth and effective ion charge 3=20344
 ZnS phosphors, trap depths 3=23125
 ZnS, rel. to structure modification 3=8583
 ZnS, trap filling by field excitation 3=23126
 ZnS, trapping levels, thermoluminesc. data 3=11019
 ZnS, Cr²⁺ deep electron trap 3=3170
 ZnSb 3=17685
 ZnSe, double acceptor levels 3=15704
 Zn₂SiO₄:Mn, trapping centres rel. to luminescence 3=13209
 ZnTe, band gap 3=20327
 ZnTe, band structure 3=17979
 Zr, de Haas-van Alphen effect data 3=25502
- etching**
 alloys, binary, anodic polariz. curves 3=11350
 α -brass films, by ions, electron micr. obs. 3=18241
 calcite, structure of etch-pits 3=8802
 charged particle tracks, selective etching 3=2843
 diamond, synthetic, microstructures on octahedral faces 3=23381
 diamond, (111) and (100) etch pits 3=1259
 diamonds, synthetic, cleavage faces 3=13406
 diamonds, synthetic, obs. 3=3266
 etchants for CdSb and ZnSb surface preparation 3=13407
 ferrites garnets of Y, Gd, Dy 3=18240
 graphite, pit orientations and shapes, variation 3=25662
 graphite, with O₂ 3=1260
 kink nucleation and motion, theory 3=11221
 mica, cleavages 3=807
 metals, by Ar ion beams, 1 keV 3=20976
 molten metal etches for orientation of semi-conductors 3=3263
 naphthalene, by evaporation 3=3934

Crystals — contd

etching — contd

- potash alum, rel. to defect orientation 3=23386
- quartz, dislocation obs. 3=25284
- semiconductors, dislocation det. on cleavage surfaces 3=4877
- semiconductors, III—V, polishing etchants 3=6821
- thermal, theory, use of $1/\gamma$ plot 3=23384
- Ag, dislocation pits in single crystals 3=806
- Ag films, by ions, electron micr. obs. 3=18241
- Al, dislocations, new etching method 3=4876
- Al, figure distribution after fusion 3=15497
- Al films, by ions, electron micr. obs. 3=18241
- Al, imperfections obs. 3=20202
- Al, striations, deform., impact, electron microscope exam., by replica 3=23534
- Au, annealing-twin boundaries, thermal 3=16029
- BaTiO₃, hillocks prod. by etching 3=11220
- Be, pits at dislocations, obs. 3=17755
- CdS, dislocations, etching obs. technique 3=8439
- CdSe, in two etchants 3=3262
- CsI, for dislocation observation 3=22791
- Cu, annealing-twin boundaries, thermal 3=16029
- Cu, dislocations due to bending, study 3=2808
- Cu, etch pits rel. to dislocations 3=1807
- Cu, rel. to dislocation study 3=22788
- Cu, Cu²⁺, dislocation densities 3=12984
- Cu₂O, dislocations obs. 3=22789
- DyFe garnet 3=18340
- Fe—Si alloy, cryst. orientation meas. 3=8873
- GaAs, Te doped, rel. to facet formation 3=12980
- GaSe, effect on elec. cond. and Hall effect 3=2913
- GaTe, effect on elec. cond. and Hall effect 3=2913
- GdFe garnet 3=18240
- Ge, anisotropic soln., light figures study 3=13410
- Ge, anodic etching, special effects 3=16027
- Ge, anodic 3=16028
- Ge, corrosion pot., and diffusion profile, n-type 3=20228
- Ge, changes in elec. props. on etching in H₂O₂ 3=2899
- Ge, near dislocations, temp depend. 3=17756
- Ge, slip dislocations, single without cracks 3=22792
- Ge, striations obs., and growth 3=22786
- Ge, with KI—I₂ redox system 3=8440
- KCl, and polishing 3=18242
- LiF, and dislocation jump motion 3=20201
- LiF, kink kinetics 3=11221
- MgO, etch pits, evidence for dislocation distribution 3=25283
- Mn—Ni—Cu alloys, thermal etching, grain structure 3=3315
- NaCl, dislocations, new technique 3=1258
- NaCl, dislocations 3=17757
- NaCl, selective, kinetics meas. 3=13409
- NaCl, selective, various etchants 3=13408
- NaCl, thermal, rel. to crystal growth theories 3=23387
- Ni films, aggregate structure 3=1373
- PbSe, rel. to quenching 3=22736
- Se, hexagonal single crystals 3=23385
- Si, anisotropic soln., light figures study 3=13410
- Si, highly-doped preferential on "rod" interactions 3=20171
- Si, n-type, growth bands, non-uniform impurities 3=20782
- Si layers, vapour grown 3=804
- Si, thermal 3=18030
- TiO₂, rel. to dislocation motion 3=11219
- W, etch figures, rel. to etching solution 3=20783
- YFe garnet 3=18240
- Zn, cleaved, pits, spirally terraced 3=22787
- Zn, revealing of dislocations on {10 $\bar{1}$ 0} faces 3=10676-7
- Zn—2% Au, rapidly solidified, regular cell pattern, etching obs. 3=23470

excitons

- absorption, light, moments, temp. var., calc. 3=20461
- absorption, light propagation, rel. to spatial dispersion 3=20429
- additional light waves 3=10813
- alkali halides, α and γ bands, exciton model 3=20467
- alkali-halides, "transfer" model 3=8406
- anisotropic crystals, energy band structure 3=2767
- anthracene, diffusion, in photocond. model 3=2970

Crystals — contd

excitons — contd

- anthracene, exciton—exciton interactions and photoconductivity 3=8568
- anthracene, triplets 3=18041
- benzene, exciton—phonon interaction 3=10586
- benzene, low-temp. luminesc. mechanism 3=11003
- benzene, rel. to absorption spectrum 3=20493
- benzene, triplet exciton interactions 3=25492
- Bose—Einstein condensation conditions 3=20142
- bound, with coupled phonon field, optical spectra 3=10906
- cuprite, green and yellow series as exciton spectra 3=25455
- dispersion of e.m. waves, theory 3=6499
- and dispersion, optical, propag. direction depend. 3=20431
- e.m. wave propagation 3=4845
- exciton—phonon system 3=20142
- fermion behaviour of some-dimensional excitons 3=20143
- Frenkel excitons in various symmetries 3=2766
- generation by excitation and ionization, caused by radiation 3=2841
- impurity absorption near exciton bands, theory 3=17993
- impurity levels in molecular crystals 3=10649
- insulators, theory rel. to dielec. effects 3=2944
- ionic crystals, absorption, and dynamic character 3=20442
- ionic crystals, refractive indices 3=23034
- "mechanical", optically active crystal surfaces, e.m. excitation 3=20140
- metals, plasma modes of excitation 3=25256
- molecular, accel. by elec. field, theory 3=15473
- molecular crystals, exciton processes 3=20144
- molecular crystals, long wave theory 3=20428
- molecular crystals, luminescence, role of defects 3=23099
- naphthalene, capture by anthracene impurity, mechanism 3=20139
- naphthalene, fluoresc. spectrum, 2°—100°K 3=25493
- $n \rightarrow \pi^*$ transitions, comparison of exciton and MO calc. 3=12804
- optical absorption and dispersion near transitions 3=15668
- optical creation in elec. fld., selection rules 3=10937
- and optical props. 3=17692
- organic, π -electron, interactions for triplet states 3=25492
- perturbed, spectra 3=10932
- phenanthrene, fundamental absorption band region 3=20494
- polymers, vibrational effects in exciton motion 3=10561
- refractive index and absorption dispersion relations 3=1564
- and refractive index, light, cubic O_h symmetry 3=17922
- review, especially Cu₂O, CdS, HgI₂, spectra 3=22689
- scattering by dislocations 3=20141
- and scattering, e.m. waves, Rayleigh 3=17989
- secondary e.m. waves, supplementary boundary conditions 3=20430
- selection rules and energy spectrum 3=15472
- semiconductor, drag by charge carriers, calc. 3=17691
- semiconductors; optical and magneto-optical effects as examination tools 3=2994
- semiconductors, organic, and photoconductivity, calc. 3=20396
- semiconductors, spectroscopy, for laser appl. 3=7330
- structure analysis, rel. to electron-vibrational spectra 3=17992
- in superconductors, excitations, rel to thermal conductivity 3=328
- surface, rel. to e.m. waves 3=29465
- theory, using new theorem on determinants 3=2764
- triplet gas, linear, free, quantum states, calc. 3=25252
- triplet—triplet annihilation in molecular crystals 3=10981
- AgI, exciton spectrum 3=4975
- CaSO₄, from S X-ray K absorpt. spectrum Stark effect 3=23097
- CdS, Bose—Einstein condensation 3=6498
- CdS, bound exciton complexes, opt. props. 3=6651
- CdS, bound 3=10630
- CdS, energy transport under electron bombard. 3=13072
- CdS, exciton—phonon interaction, nature 3=18000
- CdS, and optical absorption, 4·2°K 3=8594
- CdS, rel. to luminescence 3=10986
- CdS, spectrum, lattice deformation effects 3=22688
- CdSe, Bose—Einstein condensation 3=6498

Crystals — contd

excitons — contd

- CdSe, exciton in reflection spectra 3=20441
- CdSe, spectral lines rel. to lattice defects 3=6652
- CdTe, excitons in reflection spectra 3=20441
- CuCl, exciton spectrum, elec. field effects 3=8405
- CuCl, spectra at 4.2°K, rel. to allowed transitions 3=2765
- Cu halides, spectra, low-temp. 3=10934
- Cu₂O, class 1 and 2, spectra, low-temp. quantitative investigation 3=10935
- Cu₂O, exciton absorption spectrum 3=3005
- Cu₂O, exciton scattering 3=17690
- Cu₂O, exciton spectra, theory 3=3004
- Cu₂O, in external fields 3=10631
- Cu₂O, films, and absorpt., light 3=13170
- Cu₂O, spectrum, effect of Ag impurities 3=932
- Cu₂O, yellow series, n = 1 line, oscillator strength 3=23068
- Cu₂O, Zeeman effect, polarization, up to 140 kOe 3=18002
- CuBr, exciton spectrum 3=4975
- CuCl, exciton spectrum 3=4975
- CuI, exciton spectrum 3=4975
- CuI films, absorpt. bands, 82°K 3=20473
- CuI, spectra at 4.2°K, rel. to allowed transitions 3=2765
- GaAs, emission line narrowing, rel. to exciton binding 3=15659
- GaAs, recombination radiation obs. 3=4921
- GaP, bound to defects, spectral line data 3=25253
- GaP, bound to defects, Zeeman effect 3=25254
- GaP, from luminescence spectrum, 4-2°K 3=8618
- GaSb, absorption and emission 3=10948
- Ge, indirect, annihil., in radiative recomb. 3=2900
- Ge, rel. to diamagnetic susceptibility 3=3082
- Hg halides, spectra, low-temp. 3=10934
- HgI₂, spectra at 4.2°K, rel. to allowed transitions 3=2765
- HgI₂, spectra, 4-290°K, various forms 3=25462
- K halides, rel. to intrinsic optical props. 3=25433
- KCl, interaction with vacancy clusters, rel. to glow luminescence 3=969
- LiF, interaction, rel. to extreme u.v. absorption 3=10955
- MoTe₂, strong absorption bands, reason for existence 3=25466
- Pb halides, spectra, low-temp. 3=10934
- PbI₂, spectra at 4.2°K, rel. to allowed transitions 3=2765
- Si, indirect, annihil., in radiative recomb. 3=2900
- SiC, 6H, luminesc. of nitrogen-exciton complexes 3=18034
- TiCl₃, lifetimes 3=10891
- WSe₂, strong absorption bands, reason for existence 3=25466
- ZnTe, bound 3=10630

faces

- adhesion of metal films 3=23504
- diamond, dodecahedron, effect of neutron irradiat. 3=3248
- diamond, synthetic, triangular pyramids on octahedral faces 3=23381
- diamonds, synthetic, cleavage and etching 3=13406
- diamonds, synthetic, spirals on (100) faces 3=25661
- fluorite-structure crystals, {110} face, surface energy 3=22632
- growth form, kinematic equation 3=20789
- interfaces between different crystals, stresses and energies 3=11216-17
- polarity, meas., from X-ray diffr., epitaxial layers 3=20827
- n-tetranonacontane (n-C₄₄H₁₀₀), growth habits 3=11236
- surface study by Berg-Barrett method 3=25660
- Ag, polycrystalline, heated in air 3=25292
- CdSb, cleavage 3=25649
- GaAs, grown from vapour phase, major faces 3=13404
- InSb, microhardness, anisotropy 3=18217
- KCl, surface features, Czochralski growth method 3=11218
- NaCl, surface features, Czochralski growth method 3=11218
- Si, epitaxial, stacking faults structure, origin 3=10680

growth

- See also Crystallization; Zone melting and refining.
- alkali halides, bicrystals prod. 3=6824

Crystals — contd

growth — contd

- alkali halides, by floating zones 3=6825
- p-azoxybenzoate, liquid, smectic, drop and rod 3=21313
- beryl (Be₃Al₂Si₆O₁₈), single crystals for microwave appl. 3=1264
- camphor on quartz, epitaxy 3=20805
- classical theories, confirmation 3=23387
- in condensed systems, rel. to atomic phase transition correlation 3=16032
- crucible material, use of vitreous C 3=21181
- crystallization front, impurities distrib. 3=18249
- cyclohexane, moving-vessel technique 3=11229
- Czochralski method, mixing of melt 3=13411
- dendrites, diamond and zincblende types, twin effects 3=23411
- dendritic, formation of dislocations 3=10657
- diamond, distortion and internal stresses 3=25285
- diamond, features on faces 3=23381
- diamond prod. in laboratory 3=5080
- diamonds, synthetic, spirals, hillocks and overgrowths 3=3266
- digenite (Cu₂-S), distortion and internal stresses 3=25285
- dislocations, origin 3=20187
- electric field, effects on impurity distrib. 3=18245
- epitaxial layers, face polarity, from X-ray diffr. 3=20827
- in ferrites, polycrystalline, rel. to porosity 3=6822
- form, during growth, kinematic equation 3=20789
- forms and kinetic stability 3=23388
- frazil ice, rate meas. 3=16039
- furnace, arc-image, Verneuil 3=18243
- graphite, neutron irradiated 3=25651
- hexamethylenetetramine from vapour 3=23400
- ice, on aeroplanes, in clouds 3=18252
- ice, epitaxial, on organic crystals 3=18285
- ice, growth on mica 3=16037
- ice, growth on PbI₂ 3=16038
- ice, layers, diffusion process 3=18260
- ice, in a supercooled aerosol stream, on models, struct. 3=18252
- ice, by various cyclic cpds., mechanism 3=3267
- ice-forming props. of PbI₂ aerosols 3=8987
- ideal crystals, theory 3=20784
- imperfection intake 3=20785
- impurity distribution, rate of crystallization depend. 3=23389
- layers, in drops of solns. and melts, velocity 3=25669
- macroinhomogeneities, helical, rel. to supercooling of melt 3=20786
- Magnox AL 80, grain growth, exaggerated, effect of Be 3=25760
- Magnox ZR 55, grain growth and mech. props., effect of H₂ pick-up 3=25761
- melt-grown, origin of dislocations 3=2796
- metal films, f.c.c., polycryst., stacking faults origin 3=2813
- metallic and ionic, partial epitaxy, oriented layer formation 3=16045
- metal films on rock salt, twinning 3=18238
- metal oxides and sulphides, whiskers 3=18279
- metals and alloys, preferred orientation during freezing 3=1269
- metals, freezing structure, replication on diamonds 3=8811
- metals, from melts 3=18253
- metals, nearly perfect surfaces, review 3=23500
- mica, PbS decoration study 3=16050
- Nacken-Kyropoulos method, crystal shapes 3=6824
- needle, in supercooled binary melt, kinetics 3=20787
- nucleation centres, rel. to electric field 3=18246
- nucleation commination, by precipitation method 3=20788
- nuclei formation in small drops 3=5081-2
- 1 : 1 charge-transfer complex of 1,4-diaminodurene in contact with p-chloranil 3=11228
- one-component systems, crystallization front structure rel. to thermal conditions 3=16035
- overgrowths, residual strains 3=3278
- oxide films on Mg surface, epitaxy 3=23512-13
- oxide films rel. to space charge 3=10867
- Permalloy films, epitaxial growth, effect on structure 3=16047

Crystals — contd

growth — contd

polychlorotrifluoroethylene, on KCl 3=18265
 polymer films on metal substrates, by electron bombardment 3=18266
 polytetrafluoroethylene, on KCl 3=18265
 p.v.c., increase by 1 Mc/s u.s. irradiation 3=13419
 refractory oxides, methods 3=18247
 semiconducting, Czochralski, impurities, two-crucible control 3=25671
 semiconductors, Czochralski method, additions distrib. 3=25670
 single crystals, from aq. solutions, equipment 3=13413
 slow displacement device 3=5309
 solid—liquid interface study during process 3=23393
 from solutions 3=18250
 sphalerite, distortion and internal stresses 3=25285
 spherocobaltite in $\text{CoCO}_3 \cdot \text{Co}(\text{OH})_2 \cdot \text{RCl} - \text{H}_2\text{O} - \text{CO}_2$ 3=18267
 substances with high melting points method 3=18274
 sucrose 3=8803
 n-tetranonacontane ($\text{n-C}_{94}\text{H}_{190}$), growth habits 3=11236
 vapour deposits, orientation rel. to nucleus 3=3279
 water, supercooled, use of Ag I 3=11398
 whiskers, comments on Blakely—Jackson criticism 3=8810
 Ag on AgCl, nucleation 3=16842
 Ag filament from AgI crystals 3=1268
 Ag layers in electron microscope 3=18381
 Ag platelets, transparent to electrons 3=3273
 AgCl, precipitation kinetics meas. 3=18270
 AlAgCu alloy 3=23394
 Al bicrystals, effect on degree of perfection 3=11223
 Al, dislocations, as bands, on recrystallization 3=10672
 Al films, oriented on alkali halide substrates 3=18254
 Al, impurity removal and distrib. 3=3265
 AlN, spiral, and polytypical investigations 3=18255
 AlN whiskers 3=8812
 Al_2O_3 spirals, on Al, during electropolishing 3=1261
 $\text{Al}_2(\text{SO}_4)_3 \cdot \text{K}_2\text{SO}_4 \cdot 24\text{H}_2\text{O}$, ultrasonic accel., octahedron face 3=25668
 Ar, vapour snakes 3=11224
 As, from melt, purification 3=11225
 Au, films, evap. on C 3=1375
 Au, stacking faults, mechanism 3=20203
 B, pure 3=11226
 (Ba, Bi)FeO₃, dendrites, composition 3=3277
 BaF₂, highly-perfect single crystals, for masers 3=23397
 $\text{BaFe}_{12-2x}\text{Ir}_x\text{Zn}_x\text{O}_{19}$, linewidth, rel. to composition 3=15878
 BaTiO₃, 1800°C furnace with oxygen atmos. 3=24094
 BaTiS₃, synthesis 3=8850
 BaZrS₃, synthesis 3=8850
 Be whiskers on Mo 3=18278
 BeO polar character 3=10884
 Bi alloys, solid—liquid interface 3=23393
 Bi₂Se₃, from liquid, monotectic reaction 3=16107
 Bi₂Te₃, dendritic, surface features 3=25679
 C, homogeneous and heterogeneous 3=18256
 CaF₂, highly-perfect single crystals, for masers 3=23397
 $\beta\text{-Ca}_3\text{P}_2\text{O}_7$, by hydrothermal synthesis 3=6827
 CaWO₄, by rapid pulling from melt 3=25665
 CaZrS₃, synthesis 3=8850
 CdF₂, highly-perfect single crystals, for masers 3=23397
 CdF₂ single crystals, pure and rare-earth-doped 3=3003
 CdO 3=11227
 CdS 3=20791
 CdS, introducing additives during growth 3=23395
 CdSb single crystals 3=5087
 CdSe, from gaseous phase 3=20977
 CdS, effect on form of velocity 3=25672
 CdS, large crystals 3=17704
 CdS, on silica and quartz 3=16041
 CdTe, from vapour, growth patterns meas. 3=18259
 CdTe, single crystals, from melt 3=1267
 CeF₃, highly-perfect single crystals, for masers 3=23397
 Co ferrite, ferrous free 3=11230
 CuAl—Al eutectic alloys, grain structure 3=11283
 Cu, dumbbell-shaped, preselected orientation 3=23391
 Cu, electrocrystallization 3=23415
 Cu, epitaxial on W field emitters 3=25681
 Cu, oxidation, electron-diffraction study 3=13417
 Cu oxide whiskers 3=18280

Crystals — contd

growth — contd

Cu oxinate 3=18257
 Cu phthalocyanine 3=18257
 Cu whiskers, by vapour reduction 3=18277
 Cu whiskers, effect of impurities 3=20726
 Er₂O₃, flame fusion growth 3=8805
 Fe₂O₃, Pb pyrophosphate as flux 3=5083
 Fe oxide, rel. to surrounding gas 3=18433
 Fe, single, by zone melting, preformed nuclei 3=13420
 Fe whiskers, by chem. transport 3=5090
 Fe whiskers, mag. field effects 3=13422
 Fe whiskers, by vapour reduction 3=18277
 Fe, zone-melted, slip, unusual 3=10678
 Fe₂O₃, filaments and plates 3=3268
 GaAs, contamination 3=1274
 GaAs, epitaxial films, vapour phase reaction 3=11239
 GaAs, from vapour phase, major axis 3=13404
 GaAs, reduction of Si contamination 3=13416
 GaAs on surfaces of GaAs and Ge, epitaxy 3=20806
 GaAs from Ga, zone-melting technique 3=23410
 GaS, spirals 3=11231
 GaSe, spirals 3=11231
 GaP, epitaxial films, vapour phase reaction 3=11239
 Ge, constitutional supercooling, cellular structure 3=13415
 Ge, dendritic growth mechanism 3=13421
 Ge, dendritic strips, directional 3=18282
 Ge dendrites from melted Ge 3=21614
 Ge dendrites, growth mechanism 3=25678
 Ge, double-crucible method 3=13418
 Ge, epitaxial, iodide method, temp. 3=23417
 Ge, epitaxial layer 3=18283
 Ge, epitaxy on single crystals, structure 3=3280
 Ge, facet formation 3=6823
 Ge films, epitaxial formation conditions 3=18284
 Ge films, vacuum-deposited on Ge 3=23399
 Ge, Ga-doped, constitutional supercooling 3=13414
 Ge, highly doped, As 3=20792
 Ge, interaction of In and Ga dopants 3=20793
 Ge platelets, twinned 3=20781
 Ge, and striations, etching and elec. obs. 3=22786
 Ge on surfaces of GaAs and Ge, epitaxy 3=20806
 Ge, thin films 3=23398
 HgS on rock salt crystals, epitaxy 3=16048
 InSb—Sb, by eutectic crystallization 3=23401
 K, from vapour, unit condensation coeffs. 3=3271
 K whiskers, from vapour, by field emission 3=3276
 $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$, rel. to movement and faceting 3=16034
 KBr, surfaces of melt grown ingots 3=23502
 KCl, from soln., rate and nucleation freq. 3=5084
 KCl, surface features, Czochralski growth method 3=11218
 KI 3=20795
 KIO₃, in presence of 10–14% HIO₃ 3=23405
 KMnO₄, directed, rel. to ultrasonics 3=16044
 K₂O—Nb₂O₅, peculiarities 3=16033
 LaF₃, highly-perfect single crystals, for masers 3=23397
 LiF, dry method 3=23404
 LiF, films, evap. on C 3=1375
 LiF, high-purity 3=18261
 MgF₂, highly-perfect single crystals, for masers 3=23397
 MgFe₂O₄, Pb pyrophosphate as flux 3=5083
 MgO, Pb pyrophosphate as flux 3=5083
 Mg₂Sn, from nonstoichiometric melts 3=2922
 MnCO₃, in $\text{MnCO}_3 - \text{RCl} - \text{H}_2\text{O}$, [R = Na, Li, K, Ca, Mn, Co], 3=18267
 MnO whiskers 3=23413
 Mn—Zn ferrite, effect of voids and inclusions 3=3269
 NaCl, holes and mosaic structure 3=1263
 NaCl lattice, OH[−] ion introduction 3=8432
 NaCl, surface features, Czochralski growth method 3=11218
 NaCl, whiskers 3=20804
 NaClO₄, speed 3=1262
 Ni, cathodes, relation to adhesion and emission 3=19131
 Ni ferrite, single crystals, from molten Pb oxide 3=3270
 Ni, from melt, substructures 3=1271
 Ni, recrystallization temp. lowering, by zone refining 3=18263
 NiFe₂O₄, flux growth by Czochralski method 3=16043

Crystals — contd

growth — contd

- NiO on (111) Ni surface 3=11240
 NiO₂Cu 3=8856
 NiO₂Na 3=8856
 Ni₂O₃ on Ni surfaces 3=18264
 Ni, on Si, hexagonal 3=25666-7
 Ni—Zn ferrite, effect of voids and inclusions 3=3269
 Ni—Zn—Co ferrites 3=23190
 Pb alloys, solid—liquid interface 3=23393
 Pb, large single, for neutron monochromatization 3=23403
 PbS, Bridgman—Stockbarger method 3=18262
 PbS, from melt, 100-200 atm. of N₂ 3=18244
 PbS photovoltaic layers, growth directn. 3=3356
 PbSO₄, from soln., effect of additives 3=23402
 PrF₃, highly-perfect single crystals, for masers 3=23397
 Sb, oriented single-crystal square-sectioned rods 3=3264
 Si bicrystals, Dash pedestal method 3=11235
 Si, diffusion coeffs. of impurities in melt 3=18803
 Si, epitaxial 3=16046
 Si, epitaxial films, doping profiles meas. 3=10650
 Si, epitaxial films, vacuum evap. 3=13424
 Si, epitaxial growth from SiCl₄ 3=20797
 Si, epitaxial growth of films 3=5091
 Si, epitaxial growth, stacking faults 3=805
 Si, epitaxially grown, X-ray analysis of stacking fault structures 3=25286
 Si, facet formation 3=6823
 Si, floating zone 3=18276
 Si junctions, epitaxial growth 3=23418
 Si layers, epitaxially grown, defects 3=804
 Si, n-types, etching obs., non-uniform impurities 3=20782
 Si pyrolytic epitaxial films, structure defects 3=23515
 Si, separated from gas phase, atomic significance 3=18268
 Si, SiHCl₃ reduction in H₂ stream 3=18275
 Si, from SiCl₄ decomposition, kinetics 3=13423
 Si, vapour-grown, stacking-faults 3=22794
 SiC, high spiral steps, breakdown 3=20798
 SiC single crystals, by sublimation in Ar gas 3=5085
 Si—Ge, vapour growth, epitaxial 3=3281
 Sn whiskers, rel. to heating, u.s. irradi., cooling, pressure 3=23414
 Sn alloys, solid—liquid interface 3=23393
 SnO₂Cu 3=8856
 SnO₂Na 3=8856
 Sn—Pb, 2-phase transition temperature 3=13540
 Sn—Zn, 2-phase transition temperature 3=13540
 SrF₂, highly-perfect single crystals, for masers 3=23397
 SrZrS₆ synthesis 3=8850
 TbF₃, highly-perfect single crystals, for masers 3=23397
 TiO₂, epitaxy on TiC 3=5092
 TiO₂, rutile, epitaxial 3=11241
 TiO₂Cu 3=8856
 TiO₂Na 3=8856
 TiCl₃ 3=20799
 U, irradiation-growth after mechanical working 3=8480
 UO₂, distortion and internal stresses 3=25285
 UO₂, under reactor conditions 3=20959
 W, by recrystallization 3=13541
 W, from vapour 3=23406
 W oxides 3=18271
 Y ferrites, hydrothermal synthesis 3=18272
 Yb₂O₃, flame fusion growth 3=8805
 Y₂O₃, flame fusion growth 3=8805
 Y₃Fe₅O₁₂ 3=20801
 Y₃In_xFe_{8-x}O₁₂, x < 0.5 3=20800
 Zn, large single, for neutron monochromatization 3=23403
 Zn single crystals, effect of sound waves 3=6828
 Zn, ultrasonic effects 3=23392
 ZnF₂, highly-perfect single crystals, for masers 3=23397
 ZnO.Sb₂O₃ spinel, by flux growth technique 3=3274
 ZnS, Frerich's method 3=6826
 ZnS, with HCl as vapour solvent, kinetics 3=13412
 ZnS, hexagonal, hollow crystals 3=11237
 ZnS, luminescence, effect on 3=6675
 ZnS, from melt, 100-200 atm. of N₂ 3=18244
 ZnS from soln. at room temp. 3=10997
 ZnS, from vapour, chemical transport 3=25673
 ZnS, from vapour, velocities meas. 3=8804
 ZnSb, zone melting 3=8807

Crystals — contd

growth — contd

- β-Zn₄Sb₃, semiconducting 3=22956
 ZnSe, surface triangular growth patterns 3=18273
 Zn and Zn—Sn, by zonal recryst. from wire 3=5088
 ZnTe, from melt 3=16049
 ZnTe—CdS heterojunctions, epitaxial 3=23419
imperfections
 See also Colour centres.
 alkali halide crystals, lattice distortion around impurity ions 3=22756
 alkali halides, dislocations, impurities 3=947
 alkali halides, Ag ion impurity, optical props. 3=10965
 alkali halides and azides, crystallite growth on cleavage planes, rel. to irradiation 3=20254
 alkali halides, charge of dislocations, meas. 3=22777
 alkali halides, divalent impurity aggregation, rel. to cation vacancies 3=22760
 alkali halides, doped, scattering centres 3=17779
 alkali halides, point defect formation rel. to irradiation 3=22730
 alkali halides, point defect interaction, rel. to dielectric props. at high freq. and temp. 3=22974
 alkali halides, point defects, rel. to Born repulsive potential 3=22625
 alkali halides, point defects, rel. to hardening 20.5°-300°K 3=23364
 alkali halides, vacancy—dislocation equilibrium 3=22749
 alloy, charge polarization near impurity 3=8380
 alloys, dislocation movement in fatigue hardening 3=20736
 alloys, f.c.c., stacking faults, electron microscope determ. 3=12993
 alloys, impurity electronic structure 3=22757
 alloys, vacancies, point defects, atomic displacement, rel. to neutron irradiation 3=10702
 anisotropic defects, response to stress 3=22695
 antiferromagnetics, effect on susceptibilities 3=15904
 antiferromagnets and ferromagnets, Dzialoshinski—Moriya interactions 3=15729
 antiferromagnets, vacancies and interstitials 3=15483
 atom displacement by electrons, threshold energy 3=10700
 b.c.c. lattice, $\frac{1}{2}$ (111) screw dislocations 3=25279
 binary alloy, stacking faults, thermodynamics 3=12989
 binary compounds, knock-on cascades and point defects, rel. to irradiation 3=8419
 body centred cubic elements, edge dislocation anisotropy 3=10655
 body centred cubic, moving edge dislocations 3=10654
 boundaries of crystals, simulating structure 3=3283
 α-brass, boundary and stacking-fault fringes, anomalies 3=2812
 α-brass, dislocation arrangements obs. 3=17738
 α-brass, slip plane dislocation energy rel. to orientation 3=3257
 calcite, defect formation due to twinning 3=22696
 charge recomb. and capture 3=20125
 charge recomb. and capture, little electric field effect 3=20126
 chromium luminors, deformations rel. to luminescence 3=20512
 cleavage, micro, graphite, effect on thermal expansion, accommodation 3=8371
 cluster growth rate, rel. to elastic interaction 3=22697
 concentration increase during plastic deform. 3=11154
 conference, Japan (1962) 3=20156
 and creep, activation energy 3=8769
 crystallite dias., ferrites, var. due to locking of boundaries by pores 3=11242
 crystallization from melt, reduction 3=20790
 defect config., spatial distrib., rel. to irradiation 3=17800
 defects caused by irradiation, with approx. to rigid spheres 3=8417
 defects by fast electron-irradiation, rel. to Li doping 3=22704
 deformation faults, density, α-brass, under tensile stress 3=6524
 diamond, imperfection photoconductivity 3=2975
 diamond, slip lines from distortion during growth 3=25285
 diamond, vacancies, e.s.r. investigation 3=17710
 diamonds, dislocations and vacancies 3=17731
 diamonds and fracture, review 3=23362

Crystals — contd

imperfections — contd

- diamonds, semiconducting and insulating dislocation structures 3=22944
- diamonds, single vacancy electron states 3=788
- diamonds, IIa, point defects, e.s.r. study 3=6746
- diamonds, types I and II, electron micr. 3=2783
- digenite (Cu_{2-x}S) slip lines from distortion during growth 3=25285
- dislocation boundary interact. with impurity atom 3=12968
- dislocation Burgers vector, electron micr. exam. 3=803
- dislocation dipoles, pinching-off by slide 3=4869
- dislocation dipoles after screw dislocations 3=4867
- dislocation energy radiation by accelerated through impurity fields 3=23304
- dislocation helix or prismatic loop, stress effect 3=8434
- dislocation hysteresis, theory 3=23306
- dislocation images, contrast, rel. to energy 3=20192
- dislocation kinks trapped by point defects, rel. to diffusion 3=23290
- dislocation motion, abrupt-kink model 3=2799
- dislocation movement, and Br layer removal from graphite bromide, in vacuo 3=20175
- dislocation networks, stereo-electron micrography 3=20193
- dislocation pinning in clusters, conditions 3=17717
- dislocation pinning, irradiation-induced, rel. to anomalous u.s. velocity changes 3=23325
- dislocation—point imperfection interaction, u.s. meas. 3=23326
- dislocation, due to radiation, effect on melting and solution 3=20188
- dislocation ribbons, geometry, surface influence 3=17734
- dislocation—solute atom interact., internal friction 3=20694
- dislocation, straight, nr. elastic const. plane of discontinuity 3=17716
- dislocation stress fields due to elastic anisotropy 3=10661
- dislocation vel., depend. on stress 3=13341
- dislocation vels. meas., sonic range 3=22778
- dislocations, amplitude-depend. internal friction 3=3215
- dislocations, angular, elastic stress field 3=22771
- dislocations, appl. of vectors, tensors and differential geometry 3=15969
- dislocations, charged in ionic crystal, rel. to mech. props. 3=798
- dislocations, Cottrell atmospheres, conc. distrib. 3=10659
- dislocations distribution in stacked linear arrays 3=20186
- dislocations, edge, lattice thermal resist. 3=17673
- dislocations, edge, strain plane, boundary value soln. 3=7160
- dislocations, effect on e.s.r. lineshape 3=15933
- dislocations, electron microscopy, dynamical theory 3=10675
- dislocations, eqn. of motion 3=799
- dislocations, exciton scatt. 3=20141
- dislocations, extended, energy of wall 3=10656
- dislocations, formation in dendritic growth 3=10657
- dislocations as fracture source, incipient crack theory 3=23355
- dislocations and GP zone, electronmicrographs, diffraction contrast 3=1314
- dislocations, grain boundary sources 3=17777
- dislocations, interactions and dipole formation 3=17724
- dislocations, interactions in hexagonal close-packed crystals 3=20184
- dislocations, linear, in nonuniform stress fields 3=795
- dislocations, as mag. nucleation regions, model 3=5009
- dislocations, meas. with oscillating film X-ray spectrograph 3=15490
- dislocations, and mechanical strength, review 3=25626
- dislocations, metals, b.c.c., friction-stress and yield point 3=8765
- dislocations, mica, multiple electron diffr. contrast obs. 3=20189
- dislocations, mixed type, electron micr. diffr. contrast 3=15495
- dislocations, motion in b.c.c. crystals 3=10665
- dislocations, moving, continuous distrib. 3=15492
- dislocations moving on interface, theory 3=20182
- dislocations, nichrome, deformed, structure changes on heating 3=17747

Crystals — contd

imperfections — contd

- dislocations, obs. by X-ray diffr., resolution 3=17752
- dislocations in ordered alloys, rel. to work hardening 3=1233
- dislocations, origin in crystal growth 3=20187
- dislocations, origin in melt-grown crystals 3=2796
- dislocations, Peierls energy calc. 3=12972
- dislocations, Peierls stress, rel. to Bordoni peak 3=18165
- dislocations, Peierls stress, simple model 3=2800
- dislocations, pile-up and hair-line cracks, stress effects 3=3241
- dislocations in primary slip systems of f.c.c. 3=12975
- dislocations, prismatic and glissile, interactions 3=23323
- dislocations, rel. to hardening of substitutional solid solutions 3=11186
- dislocations, role in deformation ageing 3=20723
- dislocations, screw, in elastic cylinder 3=6513
- dislocations, screw, kink motion, jogs, and generation of points and dislocation loop 3=17727
- dislocations, screw, step line, equil.; form 3=12973
- dislocations, shift of extinction contours 3=16060
- dislocations, theory and classification 3=22775
- dislocations, theory for interstitial solid solutions 3=20177
- dislocations, thermal decomposition along, kinetics 3=8958
- dislocations, X-ray diffr., Debye-Scherrer line profiles 3=25281
- dislocations, X-ray images, breadth models 3=12979
- dislocations, X-ray obs., review 3=22782
- dislocations, Ag, on torsional deform., and changes of elec. cond. 3=8490
- dislocations, Al, as bands, on recrystallization growth 3=10672
- dislocations, Ca tungstate, grown-in 3=22770
- dislocations, Cu, effect on oxidation, surface 3=16130
- dislocations, Cu, etching reagents for obs. 3=8438
- dislocations, Cu, films, changes, by electron microscopy 3=15494
- dislocations, in Cu, interaction with point defects 3=22711
- dislocations, Cu, rolled, electron microscope exam. 3=15493
- dislocations, Cu, and X-ray line 3=20946
- dislocations, Cu_2O , etch pit obs. 3=22789
- dislocations, Ge and alloying, thermal influences 3=20901
- dislocations, Ge dendrite strips 3=18281
- dislocations, Ge, dendritic strips, effect of growth conditions 3=18282
- dislocations, Ge, effect on γ defects 3=20173
- dislocations, Ge, electron microscope exam. 3=22784
- dislocations, Ge, etching, temp. depend. 3=17756
- dislocations, Ge, and excess carrier lifetime 3=17847
- dislocations, in Ge, in torsional deformation, by electron microscopy 3=6514
- dislocations, Ge, velocity, as a function of stress 3=6519
- dislocations, Ge, and X-rays, anomalous transmission 3=20947
- dislocations, LiF, jump motion, etching effect 3=20201
- dislocations, Mb, deformation effects, var. stress 3=22772
- dislocations in Mo, at isolated grains in single crystal matrix 3=6529
- dislocations, NaCl whiskers, by X-ray diffr. 3=17748
- dislocations, NaCl-KCl mixed crystals, on decomposition, obs. by etching 3=12985
- dislocations, Ni, deformed, structure changes on heating 3=17747
- dislocations, Ni, effect on magnetic domain structure 3=11059
- dislocations, Si, carrier recomb. weakened by Cu precip., O 3=20319
- dislocations, Si, electron microscope exam. 3=22784
- dislocations, Si p-n junctions, stair-rod, microplasma breakdown 3=20351
- distortion, Jahn-Teller, CuFe_2O_4 , cubic-tetragonal phase transform. 3=11205
- edge dislocations and walls, dilatational strain field 3=792

Crystals — contd

imperfections — contd

- edge dislocations, birefringent arrays, colour contrast 3=7351
- elastic medium, isotopic, deformation field 3=6785
- electric fields, rel. to optical absorption edge 3=13161
- electron microscopic images 3=800
- epitaxial layer impurity profile determ. by microwave-diode meths. 3=25273
- f.c.c. alloys, filings, by X-ray diffr. 3=8418
- f.c.c., extrinsic stacking faults, diffrn. patterns 3=18299
- f.c.c., interstitial energies for two configurations 3=789
- f.c.c. lattice, impurity diffusion, correlation factors 3=6531
- f.c.c. metals, deformation stacking faults 3=12990
- f.c.c. metals, stacking fault energy calc. 3=4879
- f.c.c., single- and double-deformation faults 3=17768
- ferroelectric domain boundaries, corrosion by, triglycine sulphate 3=8563
- ferromag. crystals, dislocations invest. with polarized neutrons 3=4871
- ferromagnetics, mag. fields of surface defects 3=11039
- ferromagnets, spin-wave impurity states 3=15764
- films, ferromagnetic, rel. to coercive force 3=15824
- fission fragment damage 3=22855
- fluorite, rel. to colour centres 3=8458
- formation by irradiation, direction depend. 3=20250
- Frank-Read source, critical shear stress 3=6522
- gamma-ray prod., Si, P doped, temp., illum. depend., mechanism 3=25312
- glasses, flaw characteristics, ionic substitution effects 3=22768
- glycine sulphate, domain wall, dislocation catching 3=6618
- grain boundaries, large angle, formation conditions 3=20213
- graphite, dislocation loops 3=17741
- graphite, displacement spikes, rel. to neutron-irrad. 3=17703
- graphite, Frenkel defect behaviour 3=10615
- graphite, neutron-irrad., interstitial annealing and displaced-atom formation 3=788
- graphite, neutron irradiated, dislocations 3=25651
- graphite, oxidation, structural aspects 3=20985
- graphite, rel. to Ar and air ion bombardment 3=17806
- graphite, rel. to ion-bombardment 3=22851
- graphite, vacancies and dislocation loops 3=4861
- graphite, vacancies, formation energy 3=22753
- graphite, vacancy loops rel. to irradiation 3=20194
- graphite, vacancy loops, rel. to Ni-irrad. and annealing 3=17705
- Group III-V, semiconductor, with Group IV substituents, defect equilibria 3=22758
- heterometry, crystal morphology rel. to cracks 3=13384
- ice, glide bands, non-basal, on plastic deformation 3=17763
- ice, impurities, rel. to thermoelectricity 3=10899
- ice, new type 3=6512
- ice, orientational defects 3=12996
- ice, rel. to elec., acoust. and n.m.r. props. 3=10644
- impurities, absorption bands, vibr. structure 3=8587
- impurities distrib., monocrystals from melt 3=18249
- impurities, dynamical Jahn-Teller effect 3=22527
- impurities, inclusions after extrusion 3=1215
- impurities, one-electron energy levels distrib. 3=2760
- impurities, paramag., in mol. crystal, variational theory 3=25274
- impurities, surface, effect on lattice motion 3=2707
- impurity atoms, elastic energy of pair interactions 3=20168
- impurity atoms, neutron scatt., vibrational spectrum 3=25187
- impurity centres, phonon-less transitions 3=10648
- impurity centres, rel. to electronic-vibrational spectral lines, Shpol'skii effect 3=20456
- impurity centres, spectra, when Condon's approx. is not valid 3=20458
- impurity diffusion in f.c.c. lattice, correlation factors 3=6531
- impurity electron scatt., in inhomog. elec. fields 3=22886
- impurity levels for excitons in molecular crystals 3=10649
- impurity nuclei, Mössbauer effect, lattice dynamics 3=4805

Crystals — contd

imperfections — contd

- impurity nucleus, Mössbauer effect 3=6461
- inclusion problem 3=790
- intake, during growth from solution 3=20785
- interaction bet. quenched-in vacancies and impurities 3=8424
- interfaces between different crystals, stresses and energies 3=11216-17
- interstitial energies in f.c.c. crystals 3=789
- interstitial-substitutional equil., in diffusion 3=20225
- interstitials, equil. distrib., crystal symm. 3=25271
- interstitials, graphite, bond energy 3=8425
- interstitials, metals, solid solutions, weak, diffusion 3=22801
- interstitials, U, and conductivity, electrical, var. with heat treatment, 4.2°-100° K 3=20270
- ion microscope, field, obs. 3=19371
- ionic crystals, crack propag., dislocation prod. 3=13383
- ionic crystals, damage by sliding and wear 3=11189
- ionic crystals, lattice defects, rel. to solid state reactions 3=12956
- iron, carbonyl powders, microdeformation, changes on annealing 3=20873
- irradiation defects, UO₂, electron microscope study 3=22847
- jogs, glide motion, and loop formation 3=6521
- jogs, interstitial-producing, in f.c.c. lattices 3=17725
- lattice damage by fission fragments 3=22857
- lattice defects, conference, Kyoto (1962) 3=10643
- lattice defects, diffraction contrast theory, numerical methods 3=2803
- lattice defects, electron diffraction contrast, theory 3=17740
- lattice defects, field ion microscope study 3=22706
- lattice defects, mobility, activated energy from glow curves 3=6509
- lattice defects, neutron irrad., rel. to resistivity 3=22769
- lattice defects, phonon scattering 3=22645
- lattice defects, rel. to Mössbauer effect 3=22698
- lattice deformation, CdS, effect on exciton spectrum 3=22688
- lattice distortion and block-size spread, by harmonic analysis applied to X-ray reflections 3=12995
- lattice distortions, frozen and reversible? 3=10653
- lattice distortions, by X-ray reflection 3=18401
- lattice dynamics, isotopic defect effects 3=20076
- lattice, Fe-Si (4%), due to plastic deformation and irradiation, effect on domain wall velo. 3=11068
- lattice, Ni, due to plastic deformation and irradiation, effect on domain wall velo. 3=11068
- lattice, Ni-Cu 30%, due to plastic deformation and irradiation, effect on domain wall velo. 3=11068
- macroinhomogeneities, helical, rel. to supercooling of melt during growth 3=20786
- martensite crystals in Fe-Ni, lattice defects 3=2810
- metal, defect pairs, residual resistivity 3=8486
- metal, f.c.c., rel. to neutron irradiation 3=8467
- metal films, f.c.c., polycryst., stacking faults origin 3=2813
- metal films, fission fragment damage 3=17802
- metal films, rel. to superconductivity 3=16133
- metal microtome sections, dislocations and subgrains 3=18425
- metals, b.c.c., impurities rel. to brittleness 3=18214
- metals, defects, single and interacting, density matrix treatment, self-consistent 3=22700
- metals, dislocation stresses, elasticity and elec. props. 3=2801
- metals, dislocations at low temp. 3=9667
- metals, effect on diffusion 3=15505
- metals, electronic structure of defects 3=8389
- metals, f.c.c., impurity diffusion, saddle-point config. 3=2789
- metals, f.c.c., irradiated, point defects, review 3=8420
- metals, f.c.c., quenched loops, stability 3=22773
- metals, grain boundary sliding 3=17774
- metals, impurities, low-concn., effect on elec. cond. 3=4902
- metals, impurities, rel. to residual resistance 3=25324

Crystals — contd**imperfections — contd**

- metals, interstitials and vacancies rel. to irradiation 3=8457
- metals, lattice defects, rel. to electron-phonon interactions 3=22674
- metals, monovalent, electrons spatial distrib. round impurity 3=8385
- metals, neutron-irradiation, dislocation loop size 3=2802
- metals, point-defect annealing, theory 3=22727
- metals, point defects, electronic structure 3=8390
- metals, point defects, kinetic eqns. 3=22719
- metals, point defects, radiation production and annealing 3=22723
- metals, pure, grain boundary structure, intergranular energy calc. 3=20211
- metals, quadratic elasticity theory and space charge 3=5053
- metals, quenched, vacancy clustering, rel. to impurities 3=17708
- mica, cleavages, etch patterns 3=807
- mica, rel. to Ar and air ion bombardment 3=17806
- mica, U-concentration meas., method 3=21020
- molecular crystals, defects and exciton luminescence 3=23099
- molecular impurity centres, lattice vibr. 3=25183
- molybdenite, rel. to ion-bombardment 3=22851
- mosaic block X-ray reflection, mutual interference 3=20210
- mosaicity of single crystals, determ. by X-ray diffraction 3=25694
- Mössbauer broadening, diffusion effects 3=4859
- moving dislocation, friction force 3=17728
- moving dislocation—point defect, dynamic interaction 3=23343
- native atomic disorders rel. to hybrid Frenkel-type 3=2788
- from neutron scattering, cold, small clusters 3=13584
- neutron scattering on, diffusion effect, energy broadening 3=4859
- noble metals, electron redistribution by point defects 3=15483
- noble metals, interstitial configurations 3=22755
- noble metals and Ni, point defect migration energies, rel. to imperfections 3=8466
- noble metals, stacking fault tetrahedra effects 3=12994
- noble metals, vacancies, properties 3=22738
- noble metals, vacancy and interstitial migration 3=23345
- nonmetallic, electric fields calc. 3=12958
- nuclear radiation effects rel. to slow charged particle fluxes 3=8464
- nucleation sites, step heights, cleaved Ge, by replica 3=20172
- one-dimensional harmonic lattice isotopical disorders, rel. to time-dependent properties 3=22636
- one-electron states of imperfect crystals 3=8399
- oxides, point defect motion in internal friction 3=25614
- Permalloy films, Cu and Co impurities rel. to magnetic properties 3=15818
- photon scattering on, diffusion effect, energy broadening 3=4859
- pits, Zn cleaved 3=22787
- point clusters, Al, on ion bombardment, obs. by electron microscopy 3=20159
- point defect annealing, random walk theory 3=23775
- point defect cluster migration 3=22728
- point defect distrib. rel. to X-ray refl. and crystal size 3=8829
- point defect emission and absorpt. by extended dislocations 3=20158
- point defect formation, dislocation uncertainty 3=12960
- point defect investigation, by precision density measurements 3=22722
- point defects, in Cu, formation during plastic deformation 3=22711
- point defects, diffusion studies 3=8456
- point defects due to dislocation crossing, theory 3=4860
- point defects, equil. configs., theory 3=15479
- point defects, high-pressure studies 3=22716
- point defects jumping, internal friction 3=3213
- point defects, localized vibr. states 3=2784

Crystals — contd**imperfections — contd**

- point defects, phonon scattering, meas. 3=22639
- point defects, trapped, relax. modes 3=25267
- point, and dislocation loops, and kink motion in screw dislocations 3=17727
- point, Al, due to α -rays and cold working, and cond., magnetoresist., Hall coeff., temp. var. 3=17816
- point, Cu, due to α -rays and cold working, and cond., magnetoresist., Hall coeff., temp. var. 3=17816
- point, impurity binding, from Mössbauer effect, review 3=25170
- polar semiconductors, impurity states, many-particle theory 3=4846
- potash alum, orientation, rel. to etch pits 3=23386
- primary recoil distrib., higher order averages 3=4893
- production, cascade theory generaliz. 3=12959
- quartz, cavities and intergranular pits 3=17776
- quartz, dislocation obs. by selective etching 3=25284
- quartz, from dielectric loss, l.f., at low temps. 3=20157
- quartz, interstitial clusters due to neutron irradiation 3=10647
- quartz, lattice defects, rel. to neutron-irradiation 3=22765
- quartz, thermoluminescence 3=11020
- quartz, traps due to X-rays, annealing 3=6555
- radiation damage: energetic atom range 3=8462
- radiation-defect annihilation, kinetics, impurity effects 3=22710
- radiation defects, calc. method 3=4894
- radiation effects, integral equations 3=8463
- radiation effects, review 3=2841
- recoil atoms in ionic solids 3=8475
- rel. to dynamical correlations between vibrational modes 3=22637
- ruby maser, growth defects 3=22763
- rutile, point-defect relaxation 3=25265
- screw dislocations, displacement field, X-ray scattering 3=2806
- semiconductor bicrystals, grain boundary thickness detm. 3=2816
- Semiconductor, with rare-earth impurities, proposed d.c. —pumped laser action 3=24521
- semiconductors, dislocation det. on cleavage surfaces 3=4877
- semiconductors, dislocation mobility theory 3=17730
- semiconductors, dislocation velocities and densities, erratum 3=10660
- semiconductors, dislocations, elec. props. 3=25335
- semiconductors, impurity centres and structural defects, activation energies 3=20294
- semiconductors, impurity states, electron-phonon coupling 3=10733
- semiconductors, rel. to fast neutron irradiation 3=22909
- semiconductors, in self-activated elec. cond. 3=17842
- semiconductors, structural defects, X-ray camera 3=25693
- slip and climb forces 3=17726
- slip, Fe, zone-melted, unusual 3=10678
- slip, intergranular, in Zn bi-crystals, by interferometry 3=6528
- small distortions, diffraction, dynamical theory 3=13576
- solid solns., quenching defects 3=8909
- solid solutions, f.c.c., stacking faults 3=8442
- solid solutions, impurity diffusion, theory 3=22803
- solids, atom distribution due to primary excited atom 3=17799
- specimen damage in electron microscope 3=20971
- sphalerite, slip lines from distortion during growth 3=25285
- sphalerite structure, dislocation cores, bond calc. 3=2793
- spike regions, form. by Ar⁺ and Xe⁺ bomb. 3=6552
- spinels, magnetic, distortions rel. to cations 3=1012
- spinels, magnetic; Jahn-Teller distortion 3=1009
- stacking faults, Au, growth mechanism 3=20203
- stacking faults, CdS, wurzite ribbon, X-ray exam. 3=15500
- stacking faults, Cu, filed, by X-ray diffraction broadening 3=20208
- stacking faults in epitaxial material 3=20204
- stacking faults, metals, face-centred cubic, electrical resistance 3=15533

Crystals — contd

imperfections — contd

- stacking faults, Moire patterns 3=20205
- stacking faults, ZnS:Cu, Cl, electroluminescence 3=23123
- steel, dislocation pile-up, hair-line crack formation 3=3241
- steel, Fe, cast, lattice distortions, effect of cold pressing, by X-ray reflection 3=18401
- steel, stainless, disloc. rearrangement by electropolishing 3=10668
- steel, stainless, dislocation rearrangement during electropolishing 3=17737
- steel with MnS inclusions, dislocations 3=25282
- steel, worked, autoradiography examin. 3=5143
- steels, austenitic, dislocations and stacking faults, rel. to precipitation 3=18357
- steels, austenitic, stacking fault formation mechanism 3=18359
- striations, Ge, and growth, etching and elec. obs. 3=22786
- structural, impurities, electron states, bound, calc., analogue 3=17681
- substituent atoms, virtual localized modes obs. by Mössbauer effect 3=4806
- substructures, formed during growth from melt, origin 3=22699
- superconductors, hard, and hysteresis and size effects, theory 3=19099
- superlattices, slip and twinning dislocations, plastic deform. 3=23319
- tin bronzes, vacancy conc. and plastic strain 3=23327
- transition metal oxides, vacancy interaction energies 3=22737
- traps, electron, ZnS-CdS phosphors, 2.5-77.4°K 3=8429
- triglycine sulphate, twins and dislocations, etching 3=22790
- twinning, as dislocation process 3=3258
- vacancies, di-vacancies, Cu, migration and binding energy 3=20164
- vacancies, graphite, bond energy 3=8425
- vacancies and hard-impurity atoms round edge dislocations 3=22742
- vacancies, metals, b.c.c. quenching, difficulty 3=22732
- vacancies, metals, noble, pressure quenching, meas. 3=22740
- vacancies, metals, solid solutions, weak, diffusion 3=22801
- vacancies, O in Cu₂O, effect on photocond. and luminescences 3=18029
- vacancy clusters, Al, effect of quenching and impurities 3=20162
- vacancy clusters, Au, effect of quenching and impurities 3=20162
- vacancy concentration, large, in some solid solutions, mechanism 3=8916
- vacancy formation, rel. to internal stresses 3=22741
- vacancy-interstitial annihil. with interstitial migration to sinks 3=6510
- vacancy interstitial diffusion, in Au, Cu, by neutrons 3=8939
- vacancy migration and order-disorder events 3=13530
- vacancy precipitation rel. to dislocation origin 3=22743
- valency, impurities or lattice defects, i.r. absorpt. 3=10928
- void nucleation during creep 3=3227
- X-ray meas., interference line analysis 3=20704
- zone melting in finite ingot, impurity motion 3=25674
- Ag, cold-worked, mechanism of stored energy release 3=11173
- Ag, dislocations in deformed 3=22779
- Ag, dislocations in single crystals, etching 3=806
- Ag, electrotransport mobility of Sn impurities 3=8433
- Ag, fault arrays produced by AgBr exposure to light 3=20199
- Ag filings, cold work damage 3=18202
- Ag, films on mica, various defects 3=1374
- Ag, films, quenched-in vacancies, effect on lattice 3=22733
- Ag, hillocks, etch pits, unstable faces, formation conditions 3=17714
- Ag, stacking fault energy, for plasticity 3=15501
- Ag, stacking faults, rel. to slip 3=1230
- Ag, twist boundaries, self-diffusivity 3=22820

Crystals — contd

imperfections — contd

- Ag vacancies, quenched-in interaction with O impurity 3=22747
- Ag, vacancy formation energy 3=17663
- Ag, vacancy supersaturation in deform. 3=13356
- Ag wires, due to plastic deform., concn. 3=13036
- Ag alloys, dilute, point defect elec. fld. gradients, rel. to valence and size effects 3=22718
- Ag-base alloys, stacking faults rel. to solute 3=2811
- AgBr : Ni, bleaching processes 3=13187
- AgCl, Co²⁺ and Ni²⁺ impurities 3=15487-8
- AgCl, dislocation-impurity interactions and strain aging 3=17718
- AgCl, fission tracks, self-decorated 3=821
- AgCl, Frenkel defects 3=10604
- AgCl, point defects 3=12966
- AgCl, polygonization 3=15502
- Ag halides, Frenkel defects 3=13007
- Ag-Li, stacking faults 3=15499
- Ag-10% Sn, f.c.c., filings, by X-ray diffr. 3=8418
- Ag-Zn alloy, packing defects, 600°-650°C 3=20160
- Al, Bauschinger effect and dislocation arrangements 3=17746
- Al, cold-deformed, from hardness meas. 3=11187
- Al, cyclic structure under large strain ranges 3=20740
- Al, cyclic work hardening, dislocations 3=20738
- Al, defect structure rel. to quench deformation 3=6515
- Al, defect structures, rel. to n-irrad. 3=17735
- Al, dislocation arrangements due to tensile stresses 3=20754
- Al, dislocation loop growth on irrad. with fission fragments 3=6520
- Al, dislocation loops, quenched, stability 3=4878
- Al, dislocation loops with stacking faults 3=10667
- Al, dislocation structure during cyclic strain 3=17749
- Al, dislocations, constant-strain fatigue 3=11328
- Al, dislocations, effect on surface work hardening 3=1232
- Al, dislocations, interstitial loops 3=4870
- Al, dislocations, new etching method 3=4876
- Al, dislocations prod. by spark discharge 3=12969
- Al, dislocations, revealed by etching 3=15497
- Al, effect on corrosion 3=6919
- Al, electron irrad. effects, recovery 3=15489
- Al, evolution of polygonization substructure 3=10670
- Al, fatigue effects 3=18213
- Al foil, 60μ thick, dislocation loops with stacking fault 3=2804
- Al, impurity distrib. 3=3265
- Al, lattice defects after plastic deform. 3=20195
- Al, lattice distortion relaxation, X-ray reflection intensities 3=3288
- Al, obs. by etching 3=20202
- Al, polycrystalline, excess vacancies and dislocation loops rel. to elec. props., 20°K 3=4907
- Al, slip line behaviour under stress reversal 3=8441
- Al, stacking faults, rel. to slip 3=1230
- Al, stationary extended dislocations, rel. to shear modulus 3=25616
- Al, substructure under constant cyclic strain 3=20742
- Al, superconducting, lattice defects, rel. to magnetic behaviour 3=19104
- Al, tangled dislocations and narrow prismatic loops 3=17743
- Al, vacancies, dislocations, stacking faults, rel. to electrical resistance 3=22891
- Al vacancy and interstitial loops, rel. to fission fragment bombardment 3=17706
- Al, zone refined, elimination by rolling in liquid H 3=16089
- Al-Ag, dislocations and stacking faults 3=25803
- Al-Cu alloy, disloc. interact with θ' precipitates 3=12977
- Al-Cu alloy, fatigue, disloc. processes 3=25610
- Al-Cu, alloys, point defect processes and quench age hardening 3=6796
- Al-(4%)Cu, dislocation-decomposition product interaction 3=23305
- Al-(1.6 wt.%)Cu, dislocations interacting with precipitate particles 3=20894
- Al-Cu, impurity effects on age hardening 3=3332

Crystals — contd

imperfections — contd

- Al—Mg alloy, dislocation sources 3=12974
 Al—Mg alloy, dislocation sources 3=17742
 Al—Mg alloy, point-defect increase and dislocation climb rate rel. to creep 3=13364
 Al—5% Mg alloy, vacancy climb rel. to solute atoms 3=22748
 Al—7% Mg alloys, defect structure rel. to quench deformation 3=6515
 Al—Mg alloys, dislocation "climb" source 3=22785
 Al—Mg dil. alloys, quenched-in vacancies 3=22745
 Al—Mg dil. alloys, vacancy—impurity interaction 3=22746
 Al—1% Mg, {012} disloc. loops analysis 3=17721
 Al—Mg, dislocations, point defects in plastic flow 3=13369
 Al—1% Mg, vacancy loops, diffraction anal. 3=22752
 Al—(7%)Mg—(0.015%)Si, dislocation loops rel. to precipitation of Mg₂Si 3=10666
 AlN, dislocations and wide stacking faults 3=4874
 β -AlNi, faults, rel. to cold-working 3=12988
 Al₂O₃, α -phase, due to γ -rays 3=3072
 Al₂O₃, with 1 wt.%Zr, dislocations after annealing 3=12976
 Al—Sn dilute alloys, Sn—vacancy interactions 3=22744
 Al—Zn alloy, Mg atom—vacancy interact. 3=20167
 Al—10% Zn, Guinier—Preston zones 3=20896
 Ar, solid, vacancy contrib. to spec. heat. 3=8364
 Ar, vacancy formation energy 3=20163
 Au, aggregate vacancy processes in annealing 3=4864
 Au, colloidal, electron diffraction, squamous contrast 3=1316
 Au, dislocation relaxation peaks 3=25613
 Au, dislocations prod. by low-energy ions 3=17723
 Au, doped, vacancy—impurity complexes, rel. to quenched-in resistivity 3=17818
 Au fatigue effects 3=18213
 Au films, doped, clusters of point defects 3=25270
 Au films, fission-fragment damage 3=22864
 Au films, interstitial damage, rel. to Ar ion bombardment 3=17712
 Au, Hg impurities, effect on neutron irradiation 3=2848
 Au, interstitials, in electron effects annealing 3=2846
 Au, lattice vacancies, resistivity 3=22893
 Au, point defects due to plastic deformation 3=22720
 Au, point defects, rel. to electron irradiation 3=22726
 Au, stacking-fault tetrahedra and black spots, rel. to α -irradiation, 1–35 MeV 3=17770
 Au, stacking fault tetrahedra nucleation 3=22798
 Au, thermal spikes, obs., by sputtered atom energy spectrum 3=8421
 Au, vacancies and divacancies, diffusion 3=4863
 Au, vacancy formation energy 3=17663
 Au, vacancy formation, pressure effect 3=8430
 Au, vacancy pairs, residual resistivity 3=8486
 Au, void formation, strain induced 3=13364
 Au wires, due to plastic deform., concn. 3=13036
 Au, wires, excess vacancy liquidation rel. to plastic deformation 3=4862
 Au—Ag alloys, vacancies, ordering on heat treatment 3=22894
 Au—Cd alloys, quenched in defects 3=22714-5
 Au—20% Cd, f.c.c., filings, by X-ray diffraction 3=8418
 Au—Cd—Cu alloys, quenched in defects 3=22714-5
 Au—Co alloys, dislocation densities at low temp. 3=10614
 BaCrO₄, radiation damage effects 3=13016
 BaFe₂O₈, dislocations, rel. to mag. nucleation 3=5009
 BaTiO₃, effect on props. of MnO₂ doping 3=8560
 Be, etch pits at dislocations, obs. 3=17755
 Be, gas bubbles at grain boundaries rel. to irradiation 3=8471
 Be, impurity solubility 3=25272
 Be, polycryst., dislocation configs., annealing effect 3=20190
 BeO, defect configurations rel. to heavy-atom bombardment 3=22865
 BeO, grain fragmentation at high temps. 3=2818
 BeO, irradiation, neutron diffraction exam. 3=3289
 BeO, neutron irradiation 3=18298
 BeO, neutron-irradiation effects 3=8426
 BeO, rel. to neutron-irradiation 3=20255
 Bi, cleavage dislocations 3=12983

Crystals — contd

imperfections — contd

- Bi, dislocations prod. by spark discharge 3=12969
 Bi, dislocations, rel. to accommodation region 3=8801
 Bi with Sb impurities rel. to der Haas—van Alphen effect 3=3083
 Bi—Cd pair, contact melting 3=15525
 Bi—Pb pair, contact melting 3=15525
 Bi₂Te₃, mechanical deformation rel. to elec. potl. 3=2901
 Bi₂Te₃, point defects, γ -induced 3=22712
 Bi₂Te_{3-x}Se_x, O content rel. to elec. and thermoelec. props. 3=860
 BiTe—SbTe, vacancy loops 3=17709
 C films, deformation during graphitization 3=13395
 C, rel. to growth 3=18256
 CaCO₃, dislocations due to twinning 3=12971
 CaCO₃, dislocations, motion during twinning, elastic 3=18239
 CaCO₃, twin lamella, dislocs. 3=12982
 CaS, Mn activator incorporation 3=12965
 CaSO₄, gypsum, fissures, rel. to dehydration study 3=25287
 Cd, dislocation multiplication and structure 3=23324
 Cd, interstitials, in electron effects annealing 3=2846
 Cd, linear hexagonal networks 3=8436
 Cd, linear, hexagonal networks 3=22774
 Cd, recovery, 78°—300°K after elongation at 78°K 3=22719
 Cd, screw dislocations, cross-slip, rel. to recovery 3=13372
 CdF₂, conversion to semiconductor 3=8522
 CdI₂, thermal decomposition along dislocations 3=17719
 CdS, dislocations, etching obs. technique 3=8439
 CdS, double-acceptor defect by electron irradiation 3=25268
 CdS, edge dislocations, calc. from Frank's formula 3=2792
 CdS, large crystals, rel. to props. 3=17704
 CdS, stacking faults 3=808
 CdS, stacking faults 3=17769
 CdS, trap-concentration, by space-charge-limited current modulation 3=862
 CdSe, dislocations, etching obs. 3=3262
 CdSe, lattice defects rel. to exciton lines 3=6652
 CdTe, dislocations, two types 3=10664
 CdTe, double acceptor defect 3=17874
 CdTe, double-acceptor defect by electron irradiation 3=25268
 Co, β -phase, jog movement in creep 3=11162
 Co, deformation twins, by tensile loading, -196°C 3=8800
 Co, films, rel. to domain structure 3=8676
 Co films, stacking faults and dislocations 3=18086
 Co, h.c.p., plastic deform., line breadth meas. 3=11160
 Co, polycryst., dislocation density rel. to flow stress 3=11159
 Cr, recryst., impurity phases obs. 3=15485
 Cr spinels, spin-orbit and Jahn—Teller effects 3=1010
 CrBr₃, dislocation ribbons, geometry, surface influence 3=17734
 CsCl-type alloys, quenched in defects 3=22714-5
 CsI, dislocations, observation by etching 3=22791
 Cu, atom-deficient zones, rel. to radiation hardening 3=23340
 Cu, AuAl, dislocations study by etching 3=12984
 Cu, bent, dislocations, etch pit study 3=2808
 Cu, cold-deformed, from hardness meas. 3=11187
 Cu, cold-worked, mechanism of stored energy release 3=11173
 Cu, deformed, dislocation loops 3=17750
 Cu, disloc. config. after high-temp. creep 3=12978
 Cu, dislocation array after plastic deform. 3=15496
 Cu, dislocation density and plastic flow 3=794
 Cu, dislocation dipoles, tangles and loops 3=17732
 Cu, dislocation interactions, rel. to work-hardening 3=23344
 Cu, dislocation loops, prismatic 3=10671
 Cu, dislocation loops, rel. to stress-strain relns. 3=2805
 Cu, dislocation pinning on electron irradiation 3=796
 Cu, dislocation relaxation peaks 3=25613
 Cu, dislocations, etch-pit studies, rel. to annealing and irradiation 3=22788
 Cu, dislocations prod. by low-energy ions 3=17723
 Cu, dislocations, rel. to chemical etch pits 3=2807

Crystals — contd

imperfections — contd

- Cu, dislocations, X-ray diffr. study 3=6523
- Cu divacancy mechanism of irradiation hardening 3=20721
- Cu, divacancy migration, recovery from radiation effects 3=22751
- Cu, electrocrystallization, substrate imperfections 3=23415
- Cu, electron bombardment damage, 4-2°K 3=8468
- Cu, electron-irradiated, rel. to internal friction 3=1218
- Cu, electrotransport mobility of Sn impurities 3=8433
- Cu fatigue effects 3=18213
- Cu fatigued, dislocation distrib. 3=20739
- Cu, films, distortions and grain structure 3=2817
- Cu, films, quenched- in vacancies, effect on lattice 3=22733
- Cu, Frenkel pair formation by electrons 3=20250
- Cu, Frenkel pair production, rel. to fast neutron irradiation 3=8431
- Cu glide dislocations, rel. to irradiation-produced prismatic dislocations 3=17760
- Cu, lattice distortion relaxation, X-ray reflection intensities 3=3288
- Cu loops and black spots, rel. to α -irradiation, 1.5 MeV 3=17770
- Cu, neutron-irradiation, loop size distrib. 3=17722
- Cu, persistent slip bands near grain, twin boundaries 3=2809
- Cu, point defect formation, dislocation uncertainty 3=12960
- Cu, point defects, rel. to electron-irradiation 3=22726
- Cu, stacking fault energy calc. 3=10656
- Cu, stacking faults in thin single crystals 3=10681
- Cu, stacking faults, rel. to slip 3=1230
- Cu, stationary extended dislocations, rel. to shear modulus 3=25616
- Cu, vacancies, energies of formation 3=15481
- Cu, vacancies, equil. concns. meas. 3=8428
- Cu, vacancy cluster effect on stress-strain props. 3=25618
- Cu, vacancy clustering in dislocations, internal friction meas. 3=23289
- Cu, vacancy clusters 3=17707
- Cu, vacancy formation energy 3=17663
- Cu whiskers, growth and strength, impurity effects 3=20726
- Cu and Cu alloys, stacking faults, rel. to electrical resistivity 3=22795
- Cu alloys, stacking-fault energies, rel. to solute atoms 3=22796
- Cu-Al alloy, vacancy formation by quenching 3=20868
- Cu-Al alloys, dislocation distrib. and densities 3=17753
- Cu-Al alloys, f.c.c., deformation twinning 3=17766
- Cu-Al martensites, stacking faults 3=20869
- Cu-(Al, Zn), stacking faults 3=23348
- Cu₂Au, antiphase boundaries 3=18334
- Cu₂Au superlattice, off-stoichiometric, dislocations 3=13495
- Cu₂Au-type alloys, ordered, divacancies reduced mobility 3=12961
- Cu-Be alloy, elastic lattice distortion around GP zone 3=1314
- Cu-(2 wt.%)Co, dislocations interacting with precipitate particles 3=20894
- Cu-Ga alloy, stacking faults type 3=12993
- Cu-Ge alloy, stacking fault density 3=12986
- Cu-Ge alloys, stacking faults 3=22797
- Cu-Ge-Si alloy, stacking fault density 3=12986
- Cu₂O, defect structure 3=22735
- Cu-Sb alloy, dislocations, rel. to yield behaviour 3=6870
- Cu-Si alloy, stacking fault density 3=12986
- Cu-Si alloy, vacancies, role in $\alpha \rightarrow \kappa$ transf. 3=1353
- Cu-Si alloys, deformed, atomic rearrangements 3=22701
- Cu-10% Si, f.c.c., filings, by X-ray diffr. 3=8418
- Cu-Si-Mn alloys, deformed, atomic rearrangements 3=22701
- Cu-Si-(Mn) alloys, stacking fault probability rel. to deformation and annealing 3=22701
- Cu-Zn alloys, stacking faults, rel. to slip 3=1230
- Fe, α -phase, dislocation structure, by electron micr. 3=4875
- Fe, α -phase, slip bands after neutron irradiation 3=809

Crystals — contd

imperfections — contd

- Fe, annealed, dislocation networks 3=20200
- Fe, b.c.c., clustering of N impurities 3=20166
- Fe, cast, steel, lattice distortions, effect of cold pressing, by X-ray reflection 3=18401
- Fe, defect reorientation rel. to magnetization by neutron irradiation 3=8469
- Fe dislocation arrays, electron microscope replica technique 3=17739
- Fe, dislocation distribution by etch method 3=15498
- Fe, dislocation images by transmission electron microscopy 3=801
- Fe, dislocation-intrusion atom interaction rel. to yield point 3=5065
- Fe, dislocation movements in creep 3=23335
- Fe, dislocations under creep, rel. to precipitates 3=18189
- Fe, dislocations when in tension 3=20198
- Fe, N and C clustering 3=22759
- Fe, point defects, rel. to n-irradiation 3=17702
- Fe wires, dislocation atmospheres, density 3=13333
- α -Fe, deformation twins, indented surface markings 3=13403
- α -Fe, dislocations, shock wave induced 3=4872
- α -Fe, point defect and dislocation interactions, due to neutron irradiation 3=8477
- γ -Fe₂O₃, vacancy distrib. 3=787
- Fe-C, precipitation of C, rel. to radiation-produced defects 3=22866
- Fe-Cr-Ni alloys, stacking faults 3=12987
- Fe-N, cold-worked, interstitial-dislocation interaction 3=23293
- Fe-Ni alloy, dissociated dislocations, obs. 3=17767
- Fe-Ni alloy, stacking faults 3=12987
- Fe-Ni alloys, irradiation-induced defects, rel. to magnetic structure 3=22729
- Fe(50%)-Ni(50%), vacancies, rel. to neutron irradiation 3=11056
- Fe_{0.998}S, lattice distortions, by neutron diffraction 3=1023
- Fe-(3.1-3.6%)Si, deformation twins 3=17778
- Fe-3%Si, dislocations after plastic deformation 3=20176
- GaAs, defects produced by Li 3=8423
- GaAs, high defect concn. 3=791
- GaAs; impurity Li, properties rel. to Zn and Te doping 3=10818
- GaAs, isolated defects rel. to length changes 3=22861
- GaAs, Te-doped facet formation rel. to supercooling 3=12980
- GaSb, absorption and emission 3=10948
- GaSe, dislocations, partial, interacting 3=10662
- Ge, applic. of precipitation techniques 3=22703
- Ge defects, production and alteration, rel. to electron irradiation 3=22724
- Ge, dislocation arrays due to deformation 3=10669
- Ge, dislocation density, rel. to anomalous X-ray transmission 3=20196
- Ge, dislocation distrib., rel. to deformation 3=15490
- Ge, dislocation etching 3=8440
- Ge, dislocation lines in grain boundary layers 3=22927
- Ge, dislocation mobility 3=23288
- Ge, dislocation mobility, meas. 3=17729
- Ge, dislocation velocities and densities, erratum 3=10660
- Ge, dislocations from indentation 3=20758
- Ge, dislocations in mono-crystals, effect of annealing 3=6516
- Ge, dislocations and nucleation of oxidation 3=25276
- Ge, dislocations, rel. to carrier recombination 3=2898
- Ge, dislocations, rel. to carrier recombination 3=17860
- Ge, dislocations, rel. to domain formation 3=17772
- Ge, dislocations, surrounding electrical fields, electron mirror obs. 3=10783
- Ge, dislocations, X-ray obs. 3=6526
- Ge, dislocations, X-ray refl. intensity 3=5063
- Ge, elastic deformation, X-ray data 3=20197
- Ge, electron-irradiation effects, rel. to carrier recombination 3=15570
- Ge, electrons, corrosion pot., and diffusion profile in etching, n-type 3=20228
- Ge films, dislocations, rel. to triangular surface patterns 3=20925
- Ge, impurities, rel. to Hall effect carrier concentration discrepancy 3=17861
- Ge, impurities, subeutectic solubilities 3=20315

Crystals — contd

imperfections — contd

- Ge, "inborn" dislocations and recombination 3=20179
 Ge, lattice defects, charge carriers recombination 3=20305
 Ge, n-type, elec. cond. along tilt and twist grain boundaries 3=854
 Ge, neutron damage, direct observation 3=6553
 Ge, neutron-irrad. defects in tunnel (Esaki) diodes 3=17918
 Ge p-n junction, dislocations in base crystal, breakdown characteristics 3=8533
 Ge, rel. to electron-irrad. 3=22859
 Ge, shallow donors, ground state energies 3=22681
 Ge, slip dislocations, single without cracks, etching obs. 3=22792
 Ge, stacking-fault energy 3=17765
 Ge, surface, recomb. with adsorpt. of polar liquid mols. 3=22709
 Ge surfaces, abraded, dislocation cracks 3=12981
 Ge tunnel diodes, voltage annealing of radiation damage 3=10860
 Ge, vacancies and dislocations, impurity diffusion mechanism 3=20222
 Ge, vacancies, quenched-in 3=22750
 Ge, vacancies, strains and mech. relax. 3=22754
 Ge, vacancy and lattice distortion, formation energy 3=6511
 Ge wafers, slip and Lomer-Cottrell barriers 3=10679
 H₂O-HF solid solns., lattice defects 3=10644
 α He³, rel. to self-diffusion and spec. heat 3=8422
 HfO₂, defect structure rel. to O₂ press. 3=12957
 In, electron-impurity collision frequ. 3=22676
 InSb, dislocations, rel. to plastic deformation 3=1223
 InSb, isolated defects rel. to length changes 3=22861
 InSb, microperiodic impurity striations, i.r. meas. 3=22762
 InSb single crystals, distrib. of S impurity 3=2790
 KBr, Frenkel, X-ray production energy 3=15517
 KCl, β -irrad., rel. to elec. charge of dust from 3=902
 KCl, dislocation loops, rel. to electron bombardment 3=17808
 KCl, dislocations by electron microscope and diffraction 3=802
 KCl, effect on scattering of light in single crystals 3=920
 KCl, electron irrad., electron micr. obs. 3=2782
 KCl, electron microscope obs. 3=17711
 KCl, Frenkel, X-ray production energy 3=15517
 KCl, generation mechanisms by X-irrad. 3=6545
 KCl, loop structures from electron irrad. 3=12967
 KCl, OH⁻ impurities, rel. to optical and elec. props. 3=18005
 KCl, point defect aggregation 3=22731
 KCl, rel. to electron and X-irrad. 3=22708
 KCl, surface defects, high temp. processes 3=20214
 KI, dislocation loops, rel. to electron bombardment 3=17808
 Li₂CrO₄, n-irradiated, thermal annealing kinetics 3=17700
 LiF, defect growth, rel. to neutron-irrad. 3=22868
 LiF, dislocation mobility theory rel. to flow stress 3=5070
 LiF, dislocations around indentation, rel. to strength 3=12970
 LiF, dislocations, Peierls stress 3=18165
 LiF, dislocations, pipe diffusion of Na 3=10687
 LiF, F₂⁺ centres, rel. to specific heat 3=15439
 LiF, interstitials, rel. to colour centres 3=2835
 LiF, lattice defects, rel. to neutron irrad. 3=22702
 LiF, neutron-irrad effects, -195° to 100°C 3=22870
 LiF, surface defects, high temp. processes 3=20214
 LiF surfaces, fission fragment damage 3=17804
 Mg, dislocation dipoles, tangles and loops 3=17732
 Mg, dislocation processes in stress relax. 3=23310
 Mg foils, dislocations, dipole, loop, prismatic 3=17751
 Mg, grain boundary cavities, nucleation 3=17773
 Mg, vacancies, formation and activation energies and mobility in quenched and cold worked 3=25269
 Mg oxide, impurity precipitation 3=20169
 MgO, dislocation Burgers vector, electron micr. exam. 3=803
 MgO, dislocation damping at low freq. 3=3214

Crystals — contd

imperfections — contd

- MgO, dislocation introduction, rel. to tensile strength 3=25639
 MgO, dislocation loops after cold-working and annealing 3=25277
 MgO, dislocation loops on neutron irrad. 3=25310
 MgO, dislocations, motion in slip 3=5071
 MgO, dislocations, rel. to neutron-irrad. 3=18185
 MgO, grown-in dislocations, ppt. particles identified 3=10673
 MgO, plastically deformed, dislocation distribution 3=25283
 MgO, point defects 3=22717
 MgO, slip bands, rel. to irrad. 3=17761
 MnBi, dislocations, rel. to mag. nucleation 3=5009
 MnS, O impurities, rel. to magnetic susceptibility 3=25554
 Mo, b.c.c., dislocation uncertainty 3=20174
 Mo, dislocation pinning effects 3=23313
 Mo, dislocations and subgrain boundaries 3=20212
 Mo, dislocations, tensile props. 3=1236
 Mo, lattice defects, rel. to neutron-irrad. 3=22766
 Mo, radiation damage recovery 3=8470
 Mo, vacancy annihilation on neutron irrad. 3=2787
 Mo-Re alloy, b.c.c., twinning dislocations 3=20191
 Mo-Re alloy, "emissary" dislocations 3=793
 Mo-Re alloys, dislocations, direct obs. rel. to annealing and content 3=22781
 MoS₃, displacement spikes, expt. evidence 3=4866
 MoTe₃, dislocation networks, observation 3=25466
 Na, annealing effect, 5°K 3=8445
 NaCl, cation vacancy migration, activation energy 3=12962
 NaCl, charged dislocation behaviour 3=8435
 NaCl, charged dislocations, effect on yield stress 3=798
 NaCl, charged dislocations, sign of 3=25278
 NaCl, charged dislocs., surface detection 3=22776
 NaCl, dislocation damping 3=17762
 NaCl, dislocation motion study 3=17759
 NaCl, dislocation phonon-scattering 3=22646
 NaCl, dislocations 3=17757
 NaCl, dislocations, deformed by concentrated load 3=20183
 NaCl, dislocations, effect on Cu diffusion 3=15513
 NaCl, dislocations, etching technique 3=1258
 NaCl, dislocations, linear cpds. with Cu²⁺ ions 3=25280
 NaCl, dislocations, meas. using u.s. 3=15491
 NaCl, dislocations, origin of F-centres 3=15518
 NaCl, divalent impurity ions and vacancies, rel. to nuc. mag. relaxation 3=23273
 NaCl with impurities of Ag, Br, K, phonon scattering 3=10584
 NaCl, impurity ions, phonon scatt. 3=6473
 NaCl, inclusion of Cu atoms 3=10651
 NaCl, lattice distortion rel. to impurities 3=15484
 NaCl lattice, OH⁻ introduction 3=8432
 NaCl, local distortions by impurity ions 3=17713
 NaCl, mosaic blocks, rel. to creep 3=20209
 NaCl, shear and dislocation structure 3=17758
 NaCl, surface defects by elec. discharge 3=13558
 NaCl, surface defects, high temp. processes 3=20214
 NaCl, surface treatment, disloc. processes 3=8785
 NaCl-type crystals, defects, rel. to X-irradiation 3=20185
 NaCl, vacancies, due to fast neutrons 3=8427
 NaCl, Fe³⁺ vacancy-impurity association 3=22631
 NaCl-BaCl system, disloc. loops 3=17720
 NaCl: Ni, Ca, dislocations, rel. to luminescence 3=20517
 Na halides, prismatic dislocations during photolysis 3=2798
 NaN₃, deformed, stacking faults 3=8443
 Nb, defect mechanisms for flow stress 3=13352
 Nb, dislocations 3=22780
 Nb, impurity content and yield stress 3=23314
 Nb, interstitial-dislocation interaction 3=23309
 NbO, vacancy interaction energy 3=2785
 α -Nb₂O₅, vacancies and elec. cond. 3=6602
 Ni binary alloys, grain shift and boundary migration 3=2815

Crystals — contd

imperfections — contd

- Ni, cold-worked, mechanism of stored energy release 3=11173
- Ni, corrugations, striations 3=1271
- Ni, dislocation structure, effect of alloying 3=10658
- Ni, dislocations, effect of dissolved H 3=11153
- Ni, dislocations prod. by low-energy ions 3=17723
- Ni, dislocations, rel. to stacking-fault energy 3=17744
- Ni, films, rel. to domain structure 3=8676
- Ni films, rel. to magnetic properties 3=15823
- Ni, grain boundary cracks in creep failure 3=18195
- Ni, impurities rel. to yield-point temp. dependence 3=5066
- Ni, impurity atom, electronic structure 3=12964
- Ni, lattice defects, rel. to ferromag. reson. 3=1172
- Ni, phase transformation by N insertion 3=1322
- Ni, point defect clustering 3=22721
- Ni, stacking faults, prod. by plastic deform. 3=20206
- Ni—Co, dislocations, rel. to stacking-fault energy 3=17744
- Ni—Co, stacking faults, prod. by plastic deform. 3=20206
- Ni—Cr, cavity formation on grain boundaries 3=3239
- Ni—Cu, stacking faults, prod. by plastic deform. 3=20206
- Ni—Fe alloy, phase transformation by N insertion 3=1323
- Ni—Fe, stacking faults in annealed alloy 3=25756
- Ni₂Fe—(3%)Mo, excess vacancies, rel. to K-state formation 3=13531
- Pb, and superconducting, critical current/mag. field 3=19112
- Pb, dislocation motion, rel. to resonance peaks 3=1220
- Pb, stacking faults, bulk specimens, measurement probabilities 3=12992
- Pb and Pb alloys, lattice vacancy equilib. concentration 3=22739
- PbCl₂, pure solid, vacancies nature 3=10645
- PbO, cation impurities, rel. to conductivity, disorder phenomena and colour 3=13075-6
- PbS, dislocations rel. to nonstoichiometry 3=25266
- PbS, effect of doping on self-diffusion 3=10688
- PbS films, evap., dislocation types 3=17754
- PbSe, anion vacancies, rel. to stoichiometry 3=22736
- Pt foils, annealed and irradiated 3=8437
- Pt foils, dislocations and fission damage 3=25275
- Pt foils, loops and dots, rel. to irradiation 3=17701
- Pt, prismatic loops, rel. to radiations 3=22767
- Pt₂Fe, thermal spikes, size meas. 3=22853
- Pt phthalocyanine, dislocation dipoles rel. to fission fragments 3=20253
- Pu, self-damage accumulation 3=22856
- Sb, dislocation mobility change, rel. to i.r. irradi. 3=18218
- Se, doped with Br and Tl, elec. props. 3=17892
- Se, trapping centres 3=873
- Si abraded surfaces, electron microscope study 3=3353
- Si, after electron irradi., photocond. study 3=22764
- Si, anti-Schottky defects 3=12963
- Si, climb of edge dislocations, Au-induced 3=17715
- Si, defect i.r. absorption spectrum 3=23076
- Si, defect vibrations, optical absorpt. 3=10581
- Si, defects, rel. to fast electron and neutron irradi. 3=22725
- Si, dislocation-free, microstrains at B impurities 3=15486
- Si, dislocation kink motion 3=10663
- Si, dislocation obs. by heat treatment in different vapours 3=20180
- Si, dislocations, discrete stress field 3=6518
- Si, dislocations, formation at cracks 3=5064
- Si, dislocations, interaction with vacancies 3=6517
- Si, dislocations in single crystals 3=797
- Si, dopants, rel. to u.v. reflection spectra 3=18007
- Si, due to protons, density calc. 3=8474
- Si, electron-bomb. defects, energy levels 3=6590
- Si, electron-bombard. defects, depth distrib. 3=22858
- Si, epitaxial films, defect structure 3=5091
- Si, epitaxial films, doping profiles meas. 3=10650
- Si, epitaxial, stacking faults structure, origin 3=10680
- Si, epitaxially grown, X-ray analysis of stacking fault structures 3=25286
- Si, highly-doped, log-like regions 3=20170-1

Crystals — contd

imperfections — contd

- Si, impurities, rel. to Hall effect carrier concentration discrepancy 3=17861
- Si, impurities rel. to lattice thermal conductivity 3=10610
- Si, impurities, subeutectic solubilities 3=20315
- Si, impurity diffusion 3=22824
- Si, impurity effects on X-ray transmission 3=23098
- Si, lattice defects, by X-ray diffraction microscopy and double-crystal spectrometer 3=22707
- Si, lattice displacements, proton induced 3=13023
- Si, lattice vacancy, e.s.r. study 3=22734
- Si layers, vapour grown, etched 3=804
- Si, neutron-irrad. defects in tunnel (Esaki) diodes 3=17918
- Si, n- and p-type, radiation introduction rates 3=6551
- Si, n-type, paramag. centre 3=6750
- Si, p—n, electron—vacancy pair formation energy 3=20165
- Si, radiation defects, annealing, rel. to P impurity 3=22934
- Si, rel. to electron-irrad. 3=22859
- Si, rel. to radiation damage and annealing 3=22933
- Si, rod and platelet lattice defects 3=22783
- Si, shallow donors, ground state energies 3=22681
- Si, stacking fault energy 3=17764
- Si, stacking faults on epitaxial growth 3=805
- Si, vapour-grown, stacking-faults 3=22794
- Si, O impurities round dislocations 3=22761
- Si, O impurity, rel. to absorption band temperature variation 3=23077
- Si:Li, electron irradi. effects, level spectrum of localized centres 3=22849
- Sn films, dislocations 3=17736
- β -Sn, screw dislocations causing twin thickening 3=25659
- β -Sn, slip- and twin dislocations 3=25658
- Sn—Bi, pair, contact melting 3=15525
- Sn—Cd pair contact melting 3=15525
- Sn—In pair, contact melting 3=15525
- Sn—Pb pair, contact melting 3=15525
- SnS₂, dislocation ribbons, geometry, surface influence 3=17734
- Sn sulphoselenide dislocation ribbons, geometry, surface influence 3=17734
- SrS, Mn activator incorporation 3=12965
- SrTiO₃, and dielectric loss, u.h.f., var. with freq. and temp. 3=17933
- SrTiO₃, electret, lattice distortions after electrification 3=10652
- Ta, dislocation loops, rel. to internal friction peaks 3=18167
- Ta, interstitial—dislocation interaction 3=23292
- Te, purified, rel. to elec. props. 3=17898
- Th, deformation stacking faults 3=12990
- Th foils, stacking fault energy 3=12991
- ThO₂—CaO oxygen vacancies, dynamic behaviour 3=20700
- Ti, α -phase, containing O, vacancies 3=6815
- Ti—(8%)Mn alloy, structural changes, rel. to wear 3=20890
- TiO, vacancy behaviour rel. to ordering 3=6815
- TiO₂, defect structure, thermograv. study 3=2786
- TiO₂, dislocation gliding, stacking faults 3=23328
- TiO₂, dislocation motion, etch patterns 3=11219
- TiO₂, dislocations in epitaxial flakes 3=5092
- TiC, rutile, lattice defects, rel. to electron energy levels 3=22955
- Tl, lattice defects, rel. to supercond. 3=12036
- TlCl, defects and dislocations, rel. to luminescence 3=952
- U, cold-rolling effects 3=8766
- U, interstitial atoms and vacancies, resistivity 3=25326
- U, irradi., dislocation loops growth, creep 3=2795
- U²³⁵, pore size and distribution, caused by fission gases, 200°C 3=22457
- α -U, dislocation loops, orientation 3=20181
- α -U, Frank dislocation formation 3=2794
- UO₂, dislocations 3=17733
- UO₂, fission fragment tracks 3=17805
- UO₂, fission fragment tracks in films 3=822
- UO₂, slip lines from distortion during growth 3=25285
- UO₂, under reactor conditions 3=20959
- W, grain boundaries and surface vacancies 3=17775
- W, vacancy formation and density 3=15482

Crystals — contd

imperfections — contd

- W wire, doped, grain-boundary impurity segregation and migration 3=4880
- WC—Co alloys, Co cementing phase, packing, deformation errors 3=16117
- W—N system disordered phases 3=23451
- W—20% Re alloy, irregular structure, rel. to α -irrad. 3=17775
- W—Re alloys, stacking faults obs. 3=18340
- Zn, cracks and defects rel. to stress/strain relations 3=18174
- Zn, dislocation loops, electron micr. study 3=6525
- Zn, dislocations in pyramid slip 3=2797
- Zn, dislocations on {1010} faces 3=10676-7
- Zn, dislocations prod. by spark discharge 3=12969
- Zn, dislocations, rel. to accommodation region 3=8801
- Zn, plastically deformed, dislocation loops 3=4873
- Zn treated with Hg, dislocations rel. to irradiation 3=20178
- Zn, vacancies, energies of formation, movement 3=10646
- Zn, vacancy structure and formation energy 3=8395
- ZnO, donors and acceptors, e.s.r. 3=13309
- ZnS, defects rel. to luminescence 3=22705
- ZnS, dislocations and wide stacking faults 3=4874
- ZnS phosphore, luminescent centres and traps, e.s.r. study 3=23112
- ZnS, stacking faults 3=8444
- ZnS, stacking faults, pressure-induced 3=20207
- ZnS, stacking faults, X-ray scatt. 3=17771
- ZnS, vacancy concn., temp. depend. 3=20161
- ZnS:Cu, effect on luminescence 3=10996
- ZnS:Cu, growth defects and luminescence 3=3055
- ZnSe, atom displacement by electron beams 3=8476
- ZnSe, double-acceptor defect by electron irrad. 3=25268
- ZnTe, dislocation densities, Te pp. 3=16049
- Zr, dislocations, arrangements, movement 3=10674
- Zr, dislocations, rel. to impurities 3=17745
- ZrO₂, defect structure rel. to O₂ press. 3=12957

internal fields

- alkali halides, Born repulsive potential 3=22625
- alkali halide, cohesive energy per cell 3=22621
- alkali halides, cohesive, n.t.p., calc. 3=22620
- alkali halides, second-order perturb. theory 3=25600
- atomic site electric field measurement 3=10972
- axial, rel. to spin Hamiltonian parameter D 3=8336
- chabazites, rel. to ion diffusion 3=6534
- complex dipole structures, electric fields calc. 3=15409
- corundum, anisotropic spin-orbit coupling of d³ and d⁴ solutes 3=2694
- corundum, Cu²⁺ ion meas. 3=13300
- crystal-field spectra of d^{3/7} ions 3=20472
- cubic, effect on ang. momentum of f-electrons 3=2749
- cubic symmetry functions 3=12901
- diamond, decay rate, study by imperfection photo-conductivity 3=2975
- diamond, periodic potentials, Fourier coeffs. 3=6455
- electric field, effects on rare-earth ions 3=10569
- energy level splitting by crystal field 3=15458
- ethyl sulphate, h.f.s. splitting of Ho 3=10572
- α -Fe, lattice binding forces 3=2984
- f.c.c., third-order, rel. to elastic constants 3=3208
- glasses, internal energy, effect of flaws 3=22768
- hexagonal close-packed lattices, periodic potentials 3=6455
- at host and added ions, comparison 3=22623
- hyperfine field in metals and alloys 3=8342
- interatomic forces rel. to frequencies of symmetry phonons 3=25179
- ionic, distorted, polarization of electron shells 3=12896
- ionic, Ewald formulae and multipole lattices 3=10568
- ligand field spectrum, cubic, three-electron 3=25166
- Madelung constant, C3 and C9 structures 3=20047
- magnetic anisotropy fields, n.m.r. data 3=3093
- matrix element tables for operators O₄^{±1}, O₄^{±1}, O₆^{±3} 3=18691
- metals, b.c.c., electrostatic coupling coeffs. 3=20050
- metals, bond strength, interatomic, var. with electronic structure 3=20045
- metals, localized mag. moments meas. 3=12908
- metals, Rydberg function as interatomic potential 3=4800
- molecular orbital study, numerical anal. 3=25165

Crystals — contd

internal fields — contd

- Mössbauer effect, effect on spectrum shape 3=22626
- α -NiSO₄.6H₂O, NiSO₄.7H₂O, symmetrics 3=8644
- n.m.r. studies in diamag. solids 3=25585
- nuclear decay, ang. correl., effects 3=8025
- octacyanide complexes, electrostatic, theory, by point charge model 3=725
- octahedral coord., V²⁺ spectrum analysis 3=12768
- octahedral, Cr³⁺ spectrum 3=25454
- octahedral, due to nearest neighbours 3=4798
- paramag. ions embedded in lattice, D and g eval. 3=15410
- paramagnetic salts, spin-system heat capacity, exper. test of Van Vleck's formula 3=22665
- paramagnetic, spin-lattice interaction 3=17647
- perovskites, cubic, superlattice Madelung energy 3=20046
- phthalocyanine, and spectra, absorpt. 3=20495-6
- π electron systems, Hückel theory, Hartman extension 3=20055
- rare earth ions, contributions from orbitals 3=20054
- rare earth ions in cubic fields, energy levels 3=12907
- at rare-earth ions, shielding, calc. 3=6453
- rare earth ions in strong fields, mag. ordering 3=20051
- rare earth oxides, field spectra 3=743
- rare earth phosphides, rel. to mag. ordering 3=20051
- rare earths, field gradients, ionic contrib., calc. 3=742
- ruby, non-uniformity, and maser operation 3=20048
- shielding in PrCl₃ 3=17629
- spinel ferrites, Mössbauer effect 3=994
- α -TeO₂, Mössbauer study 3=25169
- temperature dependence from Mössbauer meas. 3=2416
- term splitting, in many-component disordered crystals 3=22624
- thiocyanate complexes, inter-ionic bonds 3=3012
- Van der Waals crystals, cohesive energy 3=8328
- Van der Waals, paramag. impurities, variational theory 3=25274
- zero-field splitting, in 3d⁵ ions 3=25164
- Ag alloys, dilute, electric field gradients, rel. to valence and size effects 3=22718
- Ag, interaction forces rel. to vibr. spectrum 3=2716
- AgCl, Co²⁺ and Ni²⁺ impurities 3=15487-8
- Al—Ag, nearest neighbour interact. energy 3=8886
- AlSb, internal force consts. calc. 3=10580
- Al—Zn, nearest neighbour interact. energy 3=8886
- Al—Zn alloys, in GP zones during ageing 3=11295
- As, elec. field gradient 3=8332
- As structure, elec. field gradient 3=8332
- Au—Ni, nearest neighbour interact. energy 3=8886
- Bi, elec. field gradient 3=8332
- BaTiO₃, force consts. Ba—Ti—O 3=25180
- CaF₂:Dy³⁺, symm. and energy levels 3=25481
- Ca fluorophosphate, Mn²⁺ impurity 3=13168
- CaF₂:Nd³⁺, crystal field splitting 3=13167
- CaO, covalent bonding, evidence from e.s.r. data 3=25576
- CaO, rel. to MgO, e.s.r. expts. 3=3181
- CaWO₄, Ca²⁺ site, point charge model 3=12902
- CdF₂ 3=8522
- CdSe, cubic and axial field parameters 3=11115
- CdTe, lattice distortion by Mn²⁺, e.s.r. det. 3=25167
- CdTiO₃, electric 3=12903
- Ce : LaAl₃, crystalline Stark splitting of Ce³⁺ 3=20071
- CeMg nitrate, pseudoquadrupole coupling of Pm isotopes 3=12906
- Ce₂Mg(NO₃)₁₂, splittings, mag. data 3=8333
- Cl₂, solid, elec. field gradient asymmetry 3=15411
- Co—Ni alloys, dilute, at Ni 3=3199
- Co phthalocyanine, and spectra, absorpt. 3=20495-6
- Cr³⁺ ions in crystals, molecular orbital theory 3=13163
- CrO₂, anisotropy energy calc. 3=15413
- Cr₂O₃, and ruby, comparison 3=15675
- CrTe, Mössbauer study 3=25169
- CuFe₂O₄, Jahn—Teller distortion, cubic—tetragonal phase transform. 3=11205
- Cu phthalocyanine, and spectra, absorpt. 3=20495-6
- Cu²⁺ in octahedral surrounding 3=25564
- Dy₂O₃, low-lying energy levels 3=20106

Crystals — contd

internal fields — contd

- Dy³⁺, electron structure, in cubical Stark potential 3=8377
 DyFe garnet, Mössbauer effect 3=994
 Er ethylsulphate, thermal study of field splitting 3=4799
 Er(C₂H₅SO₄)₃·9H₂O, parameters for Er 3=12900
 Er₂O₃, low-lying energy levels 3=20106
 Er³⁺, electron structure in cubical Stark potential 3=8377
 (Er,Y)₂O₃, equiv. Er ions interact. 3=10565
 Eu, h.f.s., Mössbauer effect meas. 3=17631
 EuFe garnet, mag. and elec., at Eu 3=12904
 EuS, second-neighbour exchange interact. 3=15781
 Fe alloys, rel. to nuclear β -radiation 3=2417
 Fe cpds., complex and covalent bonds, Mossbauer study 3=12894
 Fe cpds., from Fe⁵⁷ Mössbauer data 3=22629
 Fe complexes, nuc. quadrupole interact 3=12905
 Fe-group ions in fluoride crystals 3=20043
 Fe, from Mössbauer effect, 4-1300°K 3=6457
 Fe—Cr and Fe—Mn, lattice binding forces 3=2984
 Fe—Re, at Re nuclei, from nucl. mag. sp. ht. 3=6479
 Fe—Rh alloys, hyperfine, Mössbauer study 3=17632
 Fe—Sb, at Sb nuclei, from nucl. mag. sp. ht. 3=6479
 Fe—Si, mag. fields and isomer shifts of Fe⁵⁷ 3=8335
 Fe₂Si, Fe₃Si, study by Mössbauer effect 3=23180
 FeAl, ordered, internal mag. field 3=8334
 Fe₂O₄, Mössbauer effect 3=994
 FeSi_{1.00;1.05;1.07}, at Fe, Mössbauer study 3=2698
 GaAs, internal force consts. calc. 3=10580
 Hf, atomic force const. 3=15437
 Hf, by quadrupole interaction, Ta¹⁸¹, 0.48 MeV level 3=6454
 Hf, static quadrupole interaction 3=4803
 Ho³⁺, electron structure in cubical Stark potential 3=8378
 Ho, from low-temp. spec. heat 3=2730
 Ho₂O₃, low-lying energy levels 3=20106
 InSb, internal force consts. calc. 3=10580
 KCl, Born repulsive energy 3=2690
 K₃Fe(CN)₆, bands rel. to 20-28 kK absorption spectra 3=3011
 MgO, action on Fe²⁺, e.s.r. meas. 3=2695
 MgO, ²E state of V²⁺, strain-induced splitting 3=23108
 MnS, α , β , and γ -phases 3=20072
 MnTe, Mössbauer study 3=25169
 Mn²⁺ in MgAl₂O₄ spinel, e.p.r., zero-field splitting 3=8712
 Mn⁵⁵, nuclear polarization in Fe 3=17636
 NaCl, Born repulsive energy 3=2690
 NaCl, charge state and quad. splitting of Fe²⁺ 3=22630
 Na₂Li₂H₂O, by Mössbauer effect in I¹³⁹ 3=2367
 Na₂B₂O₄·10H₂O and 5H₂O, at Na sites 3=25591
 Na_{0.5}La_{0.5}WO₄ doped with Tb³⁺ relaxation processes 3=25176
 NaN₃, fine structure of trapped N atoms 3=25574
 NaNO₂, Na²³ nuclear quad. coupling consts. 3=2696
 NaTaO₃, electric 3=12903
 Nd ethylsulphate, mag. h.f.s. coupling of Pm isotopes 3=12906
 NH₃, force constants 3=22566
 Ni-base alloys, K state 3=5114
 Ni oxide, during oxygen adsorption 3=13573
 Ni phthalocyanine, and spectra, absorpt. 3=20495-6
 Ni²⁺·6H₂O complex, orthorhombic field theory 3=20053
 PbZrO₃, elec. field and dipole structure 3=22997
 PrBr₃, electric field, effects on Pr³⁺ 3=10569
 Pr³⁺ in PrCl₃, contributions from orbitals 3=20054
 PrCl₃, electric field, effects on Pr³⁺ 3=10569
 Sb, elec. field gradient 3=8332
 Se, force constants, detm. 3=17630
 Sm²⁺ and Dy³⁺ levels in LaCl₃, crystal-field splitting 3=2692
 SrMoO₄ doped with Tb³⁺ relaxation processes 3=25176
 SrTiO₃, force consts. Sr—Ti—O 3=25180
 Tb, specific heat study, 0-37° to 4-2°K 3=771
 Tb³⁺ in LaCl₃ 3=15689
 TiO, analysis of diffuse refl. spectra 3=23040
 Ti₂O₃, analysis of diffuse refl. spectra 3=23040
 TiO₂, anatase and brookite, elec. fields 3=20052
 Tm, mag. field and elec. field gradient 3=8006
 V alum, trivalent, mean susceptibility 3=20049

Crystals — contd

internal fields — contd

- V³⁺, in corundum, mag. suscept. 3=20548
 Y ethylsulphate, thermal study of field splitting 3=4799
 Yb³⁺, electron structure in cubical Stark potential 3=8379
 Yb₂(SO₄)₃·8H₂O, electric field about Yb ion 3=25510
 YFe garnet, Mössbauer effect 3=994
 YFe garnet, three sites, calc. 3=2693
 YGa garnet, rel. to absorpt. spectrum of Er³⁺ 3=13172
 ZnS, transition metal impurities, rel. to luminesc. 3=3054
 ZnS : V, interpretation of luminescence 3=20530
 ZnTe, lattice distortion by Mn²⁺, e.s.r. det. 3=25167
 Zr_{1-x}U_xFe₂, hyperfine field 3=15412
- lattice mechanics**
 See also Diffusion, solids; Paramagnetic resonance and relaxation; Solids, theory.
 acoustic amplification, crossed elec. mag. fields, giant quantum osc. 3=20094
 acoustic amplification, phonon emission, stimulated 3=8354
 alkali halides, free modes of vibration 3=755
 alkali halides, lattice energy, calc. 3=17627
 alkali halides, "shell model" extension 3=20075
 alkali halides, with NaCl structure 3=8350
 alkali-halides, vibration spectra 3=20247
 alkali halides, vibrational spectrum, rel. to spin—lattice relax. 3=23249
 alkali halides, vibrations, neutron scatt., structure factors 3=22643
 alkali metals, lattice vibr. spectrum 3=17815
 anharmonic crystal, coherent neutron scatt. theory 3=4822
 anharmonic effects, conference 3=2686
 anharmonicity—interaction with higher order elec. dipole moments 3=10926
 anharmonicity, and u.s. distortion 3=17654
 anthracene, energy migration bet. impurity mols. 3=2691
 antiferroelec. linear chain model, temp. depend. vibrational spectrum 3=748
 antiferromagnets, phonon-magnon interact. 3=13285
 antiferromagnetics, nuclear spin—lattice relax. 3=18137
 antiferromagnetism due to spin—phonon interaction 3=23193
 aragonite minerals, out-of-plane bending of CO₃ ion 3=25189
 atomic collisions with crystal surface, impurity effects 3=25769
 atomic vibs., polarization 3=8344
 beryl, vibr. frequ., from optical meas. 3=10905
 Bloch wave transmission through interfaces 3=10736
 Born theory and recent techniques, review 3=22634
 Bravais lattice, Debye—Waller factor, anharmonic contribs. 3=8827
 β -brass, vibration spectrum, electronic contrib. 3=8899
 d-camphor, spin—lattice relax., -138° to +18°C 3=20679
 carbonates, inorg., lattice frequ. and rotational barriers 3=746
 channelling effects, long-range, in irrad. crystals 3=22874
 charged quasi-particle, in strong mag. field, quantization 3=25247
 cubic, effect of surface impurities 3=2707
 Debye temp., eval. by Post's method 3=772
 deformation effects, calc. 3=20078
 diamond, Ising model, low-temp. expansions 3=10198
 diamond, sum rule for vibrations and interatomic forces 3=8349
 diamond, vibration study by i.r. absorption 3=10577
 diamonds, type IIb, lattice absorption of light 3=928
 diatomic molec. crystals, librational motion 3=745
 diatomic simple cubic lattice, surface vibr. 3=25184
 dipolar lattice, statistical mechanics 3=10575
 dipole assembly on vibrating lattice, equil. approach 3=2715
 discrete freqs. in lattice perturbed by isotope defects 3=22635
 disordered chain, frequ. spectrum, self-consist. field approx. 3=17638
 disordered, frequ. spectra, moments, calc. 3=15420
 di-tetramethyl ammonium uranium hexachloride, vibrations, space-group theory calc. 3=8343
 dynamical correlations between vibrational modes, rel. to imperfections 3=22637

Crystals — contd

lattice mechanics — contd

elastic constns. calc. for arbitrary central forces by method of long waves 3=18158
 elastic interactions, of impurity atoms 3=2704
 elastic waves, internal conical refraction 3=20098
 elastic waves, quasi-transverse, theory 3=17655
 elastic waves, shear, reflection from interface of 2 anisotropic media 3=21473
 elasticity theory 3=13319
 electric quadrupole perturbations in angular correlations 3=12563
 electrical conductivity, rel. to electron and phonon mutual dragging 3=4901
 electron-lattice systems, strongly coupled, motion 3=10587
 electron-phonon system, coupled, field theory 3=20084
 electron-phonon system, elec. conduct., quantum statistical calc. 3=6468
 electron-phonon systems, non equilibrium, in external magnetic field 3=16967
 electron scatt. by phonons, inelastic, in inhomog. fields 3=22886
 electron scatt., inelastic, excitation theory 3=15479
 electron-vibration interaction rel. to damping 3=4821
 energy current carried by elastic waves 3=25186
 energy-flux operator for three-dim. lattice 3=25206
 eqn. of state at zero temp. 3=6449
 ferrites, one-quantum neutron scatt., spin-phonon interact. 3=25542
 ferromagnetic insulators, phonon instability excitation, pumping effects 3=23178
 ferromagnetic, interact. of phonons with spin waves 3=1130-2
 ferromagnetics, nuclear spin-lattice relax. 3=18137
 ferromagnets, acoustic coupling to spin waves 3=11043
 films, specific heat, thermal vibr. theory 3=12923
 films, thin, thermal vibrations 3=4810
 focused collision sequences, W, Mo 3=22881
 force constants, second and third-order, rel. to elastic constns. 3=4804
 frequencies of symmetry phonons rel. to interatomic forces 3=25179
 frequency distrib. from Born-von Kármán theory 3=2705
 frequency spectra, 1-dimensional lattice 3=12912
 gas atom bombardment theory 3=6882
 graphite, lattice vibs., electron-phonon coupling constns. 3=10714
 graphite, phonon frequ. distrib. 3=15423
 graphite (pyrolytic), dispersion relation for longit. waves 3=2710
 homopolar crystals, e.m. wave absorption 3=10589
 harmonic, statist. props., isotopic defect effects 3=20076
 impurity centres, when Condon's approx. is not valid 3=20458
 impurity nuclei, Mössbauer effect, model 3=4805
 impurity nuclei, Mössbauer effect 3=6461
 ionic crystals electron-phonon absorption 3=20442
 ionic, energy of deformed lattice 3=12896
 ionic, polar electron scatt., in magnetocond. 3=15464
 Ising systems with long-range forces, stochastic fields 3=23779
 i.r. and Raman processes, theory 3=23061
 lattice binding and neutron capture 3=20068
 lattice models, 2- and 3-dimensional, excluded vol. effect 3=16544
 linear monatomic chain, periodic vibs. 3=23735
 line shapes of radiating atom for Mössbauer, Franck-Condon effects 3=8345
 localized-mode detection, by Mössbauer effect 3=20056
 localized modes, effect on thermal cond. 3=22640
 long-wavelength vibrations, diamond-type crystals 3=6465
 magnetoacoustic resonance, quantum theory 3=23151
 metal, electron-phonon system, kinetic eqns. 3=25249
 metallic solid solns., mean vibr. state of atoms 3=8347
 metals and alloys, shear waves, finite amplitude 3=25182
 metals, axially symmetric model 3=2711
 metals, b.c.c., phonon spectrum, lattice energy 3=20050
 metals, dynamics rel. to cohesion theory 3=2706
 metals, electron-phonon, frequ.-depend. relax. 3=25250
 metals, electron-phonon interaction 3=10588

Crystals — contd

lattice mechanics — contd

metals, electron-phonon interactions, rel. to lattice defects 3=22674
 metals, long-wavelength phonons, mag. depend. 3=4808
 metals, nuclear acoustic resonance absorpt. 3=20088
 metals, nuclear spin coupling, exchange-type 3=5360
 metals of high purity 3=15531
 metals, phonon spectra, Kohn anomalies 3=25190
 metals, u.s. absorption, in elec. and mag. fields 3=2722
 metals, vibration frequency distribution and Kohn effect 3=12917
 microwave phonon instabilities in ferromag. reson. 3=5032
 molecular crystals, energy migration bet. impurity mols 3=2691
 molecular crystals, long wave theory 3=20428
 molecular crystals, vibration rel. to optical dispersion 3=23037
 molecular electronic energy relaxation 3=2748
 molecular solids, i.r. lattice combination bands 3=4969
 molecules, rot. degrees of freedom inclusion 3=8352
 Mössbauer effect for impurity nucleus 3=22627
 Mössbauer effect, impurity atom in crystal 3=25168
 from Mössbauer effect, temp. var., review 3=25170
 Mössbauer effect, virtual localized modes obs. 3=4806
 neutron scatt., exclusion of coherent scatt. 3=22642
 neutron scatt., including anharmonic terms 3=20042
 neutron scattering, cold, momentum transfer 3=4823
 nitrates, inorg., lattice frequ. and rotational barriers 3=746
 non-linear, scattered u.s. wave production 3=25191
 non-transition metals, multivalent, lattice vacancy resistivity 3=4903
 normal modes, perturbation effects 3=15421
 n.m.r. line shape analysis by lattice harmonics 3=5047
 n.m.r. second moments, vibrational corrections 3=25587
 one-dimensional harmonic lattice, isotopically disordered, time-dependent properties 3=22636
 paramagnetic ions, spin-spin nuclear interaction, by virtual phonons 3=17648
 phonon broadening of impurity spectral lines 3=20457
 phonon-cond. electron interacts. 3=22675
 phonon diffusion, coherent paramagnetic, in paramag. crystal 3=10585
 phonon dispersion law, effect of electron-phonon interaction 3=15430
 phonon frequ. shifts due to thermal expansion 3=2717
 phonon interact. with electron-hole field 3=751
 phonon lifetime in one-dimensional crystals 3=4812
 phonon, one-particle Green function 3=17645
 phonon quantum counter, theory 3=15424
 phonon scatt. by lattice defects, t matrix 3=20080
 phonon scatt. by point defects, meas. 3=22639
 phonon scattering by lattice defects 3=22645
 and phonon scatt. 3=17644
 phonon scattering, low-frequency on high, rel. to degeneracy 3=20086
 phonon spectrum, X-ray determ. for cubic solid solutions 3=5054
 phonon-spin system interact. near mag. transition point 3=20121
 phonon widths and shifts due to three-phonon processes 3=2718
 phonons and dispersion, optical, propag. direction depend. 3=20431
 phonons, parallel, mutual interact. 3=22647
 phonons, Raman scatt. by electronic spins in paramag. crystal 3=2721
 piezoelectric crystals, sound amplification limitation 3=17650
 point defects, localized vibr. states 3=2784
 Poisson transform. of
$$\sum_{j=1}^N F(\cos 2\pi j/N) \cos 2\pi j n/N$$
 3=21196
 polar lattice, optical mode travelling wave interact. with charge carriers 3=22887
 primary recoil distrib., high order averages 3=4893
 quartz, from dielectric loss, l.f., at low temps. 3=20157

Crystals — contd

lattice mechanics — contd

- quartz, E'-centres, spin-lattice relax. 3=13009
 α -quartz, optical phonons, quantum electronics 3=9966
 Raman effect, first-order, theory 3=25448
 Raman phonon scatt. in spin-lattice relax. 3=25562
 Raman spectra theory 3=937
 rare-earth salts, spin-lattice relax., field depend. 3=18144
 ruby, spin-lattice relax. theory 3=15952
 rutile, vibr. spectrum rel. to force consts. 3=10583
 semiconductor alloys, disordered, thermal cond. 3=25207
 semiconductor, degenerate, electron-phonon interaction 3=20129
 semiconductors, acoustic wave amplification, by electron-phonon interaction 3=20092
 semiconductors, diamond-type 3=1214
 semiconductors, impurity states, electron-phonon coupling 3=10733
 semiconductors, lattice vibs. 3=13047
 semiconductors, phonon distrib., effect on hot electrons 3=10759
 semiconductors, phonon drag on carriers, theory 3=25248
 semiconductors, phonon-drag Seebeck effect in strong mag. fld. 3=25246
 semiconductors, phonon spectra from i.r. spectra 3=15867
 semiconductors, vibrations, review 3=10576
 Shpol'skii effect compared with Mössbauer effect 3=20077
 singular supplementary parameter, relaxation, temp. depend. 3=8755
 slow neutron scatt. and phonon spectrum reconstr. 3=6474
 β -Sn, $\text{Sn}^{119\text{m}}$ quadrupole interaction 3=17635
 solid soln., mean atomic displacements 3=10574
 solid soln., X-ray scatt. by thermal vibr. 3=11250
 spin-lattice interaction in paramag. case 3=17647
 spin-lattice relax., phonon processes 3=15428
 spin-lattice relax. processes, direct, theory 3=8722
 spin-phonon interaction, symmetry 3=15431
 spin wave-phonon interactions in mag. films 3=20569
 statistical mechanics, plane Ising-Onsager dipole lattice, partition function 3=21202
 stimulated Raman scatt. from lattice vibs. 3=23060
 sum rate for lattice vibrations 3=8349
 superconductor, phonon freq. 3=19098
 superconductors, electron-phonon effects in specific heat 3=3950
 superconductors, lattice-electron interact. 3=5580
 thermal anharmonicity and shock adiabats 3=18179
 thermal broadening of Mössbauer and electronic spectra 3=2697
 thermal vibs., internal stresses 3=20112
 3-phonon interaction and absorption, i.r. 3=20460
 titanates, oscillation freqn. interpret. 3=25180
 transport processes, quantum theory 3=12938
 ultrasonics applied to solid state, review 3=10594
 ultrasonic wave propagation, finite amplitude, deviations from Hook's law 3=15434
 vibration amplitudes, atomic motion steric hindrance effect 3=2712
 vibration detm. by neutron scatt. rel. to interatomic force consts. 3=749
 vibration spectra of diamond-type crystals 3=17642
 vibration spectrum, from Mössbauer effect 3=15414
 vibrational freq. distrib. of single lattices, strain depend. 3=20081
 vibrational modes, disordered linear chains 3=22638
 vibrational modes in disordered systems 3=10582
 vibrational spectrum, neutron scatt., effect of impurity atoms 3=25187
 vibrational thermodynamic properties, anharmonic contrib. 3=17640
 vibrations, application of percolation problem solutions 3=13997
 vibrations of atom of different mass in cubic lattice 3=12916
 vibrations of linear lattices, model appl. to sp. ht. 3=8362
 vibrations, particle-hole excitation theory 3=2719
 vibrations, theory 3=6464
 vibrations with mol. impurity centres, theory 3=25183

Crystals — contd

lattice mechanics — contd

- vibrations of triangular, honeycomb and Kagomé lattices 3=12915
 wave scatt. by isotopes, resonance, theory 3=10595
 wurtzite structure, atom tunnelling 3=22848
 X-ray diffr., line weakening, Debye factor 3=13437
 zincblende structure, lattice vibr. spectrum 3=10580
 Ag, lattice-energy release 3=22779
 Ag, vibr. spectrum from metallic forces 3=2716
 AgCl-AgBr mixed crystals, rel. to absorpt. tail 3=3020
 Al, axisymm. model, dispersion curves 3=2711
 Al, Debye-Waller factor, 4° to 500° K 3=20082
 Al foil, Debye-Waller factor for electron diffr. 3=22656
 Al, impurity nucleus, dynamics 3=20063
 Al, vibration spectrum calc. by de Launay's method 3=2714
 Ar, elastic relaxation around a vacancy 3=20100
 Au-Co alloys, phonon cross-section for Co 3=10614
 BaTiO₃, rel. to ferroelectricity 3=898
 Be, dispersion for waves along [0001] and [0110], using slow neutrons 3=747
 Be, vibr. spectrum, from elastic consts. 3=10578
 BeO, inelastic neutron scatt., multiphonon processes 3=12911
 BeO, neutron scatt., 5-6 Å, 100-400° K, calc., one and two-phonon processes 3=20099
 Bi, vibrations, nonlinear eqn. 3=25353
 CaF₂, activity of normal vib. modes 3=10941-2
 CaF₂, vibs., from i.r. lattice absorpt. 3=10942
 CaF₂, free vib. modes 3=10940-1
 Ca(OH)₂, energy levels, by neutron scatt. 3=17643
 CaSO₄·2H₂O, monoclinic, vibration spectrum 3=23038
 Ca_xBa_{1-x}TiO₃, phonon scatt. 3=20122
 Cd, Debye temp., from low-temp. spec. heat 3=2733
 Cd oxide pressed powders with excess Cd or O, scattering 3=22940
 CdF₂, spin-lattice relax. of Yb³⁺, 2-77° K 3=18138
 CdSb, thermal vibr. amplitude 3=25649
 CdTe, optical absorption, indirect transitions 3=23067
 Cs, and alloys, electron and phonon processes 3=23027
 CsCl type, thermal vibr. spectrum and charact. temp. 3=20079
 Cu-Ag alloys, vibr. entropies of Ag 3=12922
 Cu, axisymm. model, dispersion curves 3=2711
 Cu, Debye-Waller factor, 4° to 500° K 3=20082
 Cu₂O, exciton scattering 3=17690
 Cu₂O, long wave modes, symm. coords. 3=2720
 Cu₂O, vibrations, rel. to i.r. absorption 3=22735
 Cu, phonon drag, in Peltier coeff. 3=20425
 Cu-Pt solid solution thin foils, thermal vibrations rel. to X-ray spectra 3=10973
 Cu thin foils, thermal vibrations rel. to X-ray spectra 3=10973
 Cu, vibr. spectrum by Dayal's method 3=2713
 Fe, α -phase, phonon frequ. distrib., calc. 3=22641
 Fe, Debye temp., from Mössbauer effect, 4-1300° K 3=6457
 Fe-Ni, f.c.c., two electronic structures 3=20114
 GaAs, acoustic excitation, nonlinear 3=17651
 GaP, 3-phonon combination bands 3=20085
 Ge, doped, lattice absorption of light 3=928
 Ge, impurity nucleus, dynamics 3=20063
 Ge, microwave phonon propag., rel. to doping 3=4811
 Ge, normal vibration modes, θ -series calc. 3=4809
 Ge-Si alloys, lattice vibr. spectra 3=12913
 Ge, single-phonon processes 3=10792
 Ge, sum rule for vibrations and interatomic forces 3=8349
 Ge vibration spectra, 10 to 25 μm . 3=10961
 Ho ethyl sulphate, thermal cond., phonon dispersion 3=10613
 In, electron-phonon collision frequ. 3=22676
 In, vibrational spectrum and heat capacity below 1° K 3=8348
 InSb, hot carriers-phonons energy exchange 3=22946
 InSb, i.r. absorpt. by phonons 3=23071
 K azide, i.r. vibrations 3=18004
 KBr, dispersion curves meas. 3=20074
 KBr, lattice vibs. 3=12926
 KBr, vibr. spectrum, rel. to spin-lattice relax. 3=11118
 KI, vibr. spectrum, rel. to spin-lattice relax. 3=11118
 KTaO₃, far i.r. dielec. dispersion, mechanism 3=4947

Crystals — contd**lattice mechanics — contd**

- La₂Co(NO₃)₁₂·24H₂O, phonon scatt. and thermal resistivity, low temps. 3=15427
- LiBr, vibr. spectrum, rel. to spin-lattice relax. 3=11118
- LiF, vibration spectrum, calc. 3=6466
- LiF, vibrations, freqn. and ampl. 3=15684
- Li, vibr. spectra, three models 3=12914
- Mg, u.s. absorption, 5-75 Mc/s, 4.2°-300°K 3=8353
- Mg, vibr. spectrum, from elastic constns. 3=10578
- MgO, spin-lattice relax. of Mn²⁺ 3=8724
- MgO, vibrations, freqn. and ampl. 3=15684
- Mg(OH)₂, energy levels, by neutron scatt. 3=17643
- MnF₂, antiferromag., lattice thermal cond. theory 3=25212
- MnF₂, nuclear spin-lattice relax. 3=18137
- Mo silicides, lattice heat conduction 3=25213
- Na, frequency/wave-vector dispersion curves at 90°K 3=2709
- Na, lattice vibs., frequency distrib. 3=15422
- NaCl, with CaCl₂ impurity, phonon scatt. 3=20120
- NaCl, equation of state 3=15447
- NaCl, eqn. of state from Kellermann model 3=25205
- NaCl, frequency distribution and specific heat 3=25188
- NaCl, single crystals, pure elastic modes, attenuation 3=17656
- NaCl, vibration spectra 3=20489
- NaCl, phonon scatt. by Li⁺, I⁻, Rb⁺, Ag⁺, Br⁻, K⁺ impurities 3=22644
- NaCl, phonon scattering, by dislocations 3=22646
- NaCl, phonon scattering by impurities, n.m.r. study 3=10584
- NaF, vibr. spectrum, rel. to spin-lattice relax. 3=11118
- NaI, dispersion curves meas. 3=20074
- NaI, Raman spectrum, 2537A meas. 3=25465
- NaI, vibr. spectrum, rel. to spin-lattice relax. 3=11118
- NH₄ halides, cold neutron scatt. technique 3=750
- Ni, isotopic effect, temp. dependence 3=6482
- Ni, phonon spectrum, from cold neutron scatt. data 3=25185
- Pb, frequency/wave-vector dispersion curves at 100°K 3=2708
- Pb, phonon spectra, Kohn anomalies 3=25190
- Pb, vibrations, Fermi surface image 3=6467
- Pd, n.m.r. spin-lattice relax., rotat. sample 3=20683
- Pd, role of hydrogen atoms 3=25749
- Pt thin foils, thermal vibrations rel. to X-ray spectra 3=10973
- Rb, and alloys, electron and phonon processes 3=23027
- Se, vibrational spectrum, detm. 3=17630
- Si, defect vibrations, optical absorpt. 3=10581
- Si, doped, lattice absorption of light 3=928
- Si, normal vibration modes, θ -series calc. 3=4809
- Si, optical and acoustic oscill. frequ., 293°K from X-ray scatt., diffuse 3=15419
- Si, phonon scattering by small angle grain boundary 3=10794
- Si, Raman spin-lattice relax. for shallow donors 3=11119
- Si, valence band energy, pressure depend. 3=17646
- Si, vibration frequency, 293° and 580°K 3=25181
- SiO₄ tetrahedron in silica lattice, fundamental vibrations 3=3019
- Sn, Debye-Waller factor 0°-300°K 3=20083
- Sn, grey, vibration spectrum 3=17642
- Sn, grey and white, interreln. 3=11209
- Sn, white-b.c.c. form transition 3=13452
- Sn, white, lattice dynamics theory 3=8346
- SnI₄, lattice vib. 3=8604
- Ta, Debye temp., rel. to Mössbauer effect 3=6462
- ThO₂, thermal atomic motions up to 1100°C 3=20845
- Ti(62%)—Zr(38%), from neutrons, scatt. 3=17644
- Tl azide, expansions, obs. by X-ray diffr. 3=22873
- U-10 steel, distortions after quenching, tempering 3=16106
- UO₂, thermal atomic motions up to 1100°C 3=20845
- V phonon spectrum investigation by neutron scattering 3=17641
- W, Debye temp., rel. to Mössbauer effect 3=6462
- Zn, phonon structure and interact. with electrons 3=8395
- ZrH₂, axisymm. model, dispersion curves 3=2711

orientation

- amethyst, synthetic, biaxial nature 3=25691
- α -brass, rel. to slip plane dislocation array 3=3257

Crystals — contd**orientation — contd**

- correction by oscillation photographs 3=11213
- crystal sphere orienter for non-opaque crystals 3=8821
- cyclo-octatetraene complex with Fe tricarbonyl 3=2643
- determination from three octahedral traces 3=16023
- diamond, effect on graphitization 3=13398
- diphenyldiazomethane in benzophenone, orientation 3=4775
- estimation from traces of known crystal planes 3=1255
- f.c.c. metals on NaCl, vap. deposits 3=3279
- grains, optical microscope attachment 3=20775
- graphite, on allotropically converted diamond 3=20776
- graphite, pyrolytic 3=20778
- graphite pyrolytic, by X-rays 3=6820
- metal, semiautomatic method of determ. 3=8798
- metals and alloys, preferred orientation during freezing 3=1269
- paramagnetic crystals, by e.s.r. anisotropy 3=16022
- semiconductors, molten metal etches 3=3263
- submicroscopic faces, detm. 3=18235
- texture study, methods compared 3=20777
- vapour deposits, rel. to crit. nucleus structure 3=3279
- Al crystallites, distrib. 3=25783
- Al films, grown on alkali halide substrates 3=18254
- Al, hardness anisotropy rel. to preferred orientn. 3=3246
- Au and Ag films, rel. to corrosion patterns 3=25774
- B₁₃P₂ 3=6844
- Be whiskers on Mo 3=18278
- CaS, microcrystals in thin films 3=16021
- Co single-crystal whiskers 3=23412
- Cu, electrolytically-deposited layers 3=18234
- Fe, Fe—C single-crystal whiskers 3=23412
- Fe—Si alloy, meas. from etch pits 3=8873
- Fe-3% Si, var. with rolling direction 3=6704
- Ge, forbidden 222 electron reflection, effect on 3=23440
- NaBr·2H₂O, and proton structure 3=6851-2
- NaCl, in films condensed at high rate 3=8798
- NaCl, in films condensed at high rate 3=8799
- Ni, electrolytically-deposited layers 3=18234
- Ni, single crystals, rel. to reversible susceptibility 3=20572
- Ni(H₂O)₆SO₄ 3=1339
- Sb, oriented single-crystal square-sectioned rods 3=3264
- XeF₄ 3=16073
- Zn, basal plane, grown by zone recrystallization 3=5088
- polarons**
- Boltzmann eqn., from Feynman descript. 3=12951
- capture by F-centres 3=2838
- electron-lattice systems, strongly coupled, motion 3=10587
- formation on F⁺-centre photoionization 3=20243
- free energy in uniform mag. field 3=2769
- Hall effect for band motion, theory 3=25255
- Hall mobility of small polaron, theory 3=12950
- hopping motion, thermally activated, model 3=6500
- ionization of local levels by elec. field 3=15453
- mobility, high-temperature 3=20145
- polar semiconductors, impurity states, many-particle theory 3=4846
- AgCl, AgBr, polaron mass, polaron theory of electron mobility rel. to expt. 3=2768
- NiO-type semiconductors, and low carrier mobility 3=8526
- NiO, var. with Li impurity 3=20337
- UO₂, small polaron theory for elec. props. 3=25372
- twinning**
- aniline hydrobromide, X-ray study 3=3259
- b.c.c. lattice, nucleation of {112} {111} twins 3=25279
- calcite, defect formation 3=22696
- calcite, propagation vel. det. when stressed 3=4865
- dendrite growth, diamond and zincblende types 3=23411
- dislocation theory 3=3258
- formation temperature rel. to martensite formation 3=11288
- metal films on rock salt, during growth, identification 3=18238
- metals, f.c.c., dislocation model 3=25656
- moonstone, electron microscope obs. 3=20975
- movements, boundary 3=18237
- graphite, unusual twinning 3=13405
- snow, twelve branched 3=16024

Crystals — contd

twinning — contd

- sphalerite structure, dislocation cores, theory 3=2793
- stoppage sites, defects 3=18237
- BaTiO₃, 2 types 3=18409
- Bi, accommodation region, structure 3=8801
- CaCO₃, dislocation formation 3=12971
- CaCO₃, elastic, dislocation motion 3=18239
- CaCO₃, by localized elastic stresses, kinetics 3=3260
- CaCO₃, twin lamella, dislocs. 3=12982
- Co, deformation twins, by tensile loading, -196°C 3=8800
- Cu-Al alloys, f.c.c., deformation 3=17766
- Cu-Al martensites, fine twin structure 3=20869
- CuAu 3=8902
- Cu, filed, by X-ray diffr. broadening 3=20208
- Cu, persistent slip bands near twin boundaries 3=2809
- in f.c.c. metal films, evap., mechanism 3=20780
- Fe-Al (16%), on plastic deformation 3=18236
- Fe, α -phase, deformation, indented surface markings 3=13403
- Fe-(17.2 at%)Ni alloy, electron diffraction and microscope study 3=1315
- Fe-Ni films 3=20884
- Fe, Armco, under tensile stress 3=11176
- α -Fe₂O₃ 3=11204
- Fe-Si 3.25%, plastic deformation processes 3=20713
- Fe-3%Si, plastic deformation 3=20176
- Fe-(3.1-3.6%)Si, deformation 3=17778
- Fe-Si alloy, "accommodation zone" structure 3=16025
- GaAs, X-ray examination 3=13404
- Ge dendrite strips, and resistivity, minority lifetime 3=18281
- Ge platelets, growth 3=20781
- Ge, (111) faces, rel. to epitaxial layers 3=1256
- Mg, double twinning mechanism 3=5079
- MnOOH, polysynthetic 3=1335
- Mo-Re alloy, b.c.c. 3=20191
- Mo-Re alloys, dislocation twins, rel. to annealing and content 3=22781
- Mo-35 at.%Re, on deformation 3=23380
- Mo, zone-refined, tensile props. 3=1236
- NaNO₂, twin structure of ferroelec. material 3=25657
- Ni, mechanical 3=25621
- Ni twinned cubes, by high temp. reduction of NiCl₂ in molten KCl 3=5078
- Ni-Fe, origin and growth of annealing twins 3=25756
- NiO, multiple twin domains and domain walls 3=1146
- Si, props. of twin boundaries 3=11215
- Sn, films, dislocation accumulation in boundaries 3=17736
- β -Sn, resistive stress for twin thickening 3=25659
- β -Sn, slip- and twin dislocations 3=25658
- W, on fracture surfaces 3=18210
- W, rel. to purity in single crystals 3=25617
- Zn, accommodation region, structure 3=8801
- Zn, plastic deform. induced 3=16026
- ZnSe, rel. to surface triangular growth patterns 3=18273
- Zr, deformation, on {1121}, possible double process 3=20779
- Zr, zig-zag 3=11214

whiskers

- ice, growth from supercooled clouds in elec. field 3=5089
- metal oxides and sulphides, formation 3=18279
- single vapour-grown, as field emitters 3=9829
- twist, det. from electron diffractogram dynamic fine structure 3=3275
- whiskers, comments on Blakely-Jackson criticism 3=8810
- AlN, growth 3=8812
- Be, production and orientation on Mo 3=18278
- Co, orientation and oxidation 3=23412
- Co, tensile rupture tests 3=6801
- Cu-Fe mixed, structure and hardness 3=20796
- Cu, growth and strength, impurity effects 3=20726
- Cu, growth, by vapour reduction 3=18277
- Cu, mechanical strength, tensile, increase on alloying with Ag 3=20727
- Cu oxide 3=18280
- Cu, tensile rupture tests 3=6801
- Fe, growth by chem. transport 3=5090
- Fe, growth, by vapour reduction 3=18277
- Fe oxide growth rel. to surrounding gas 3=18433

Crystals — contd

whiskers — contd

- Fe, torsional plasticity 3=8763
- Fe, Fe-C, orientation and oxidation 3=23412
- Ge dendrites, growth mechanisms 3=25678
- K, growth from vapour, by field emission 3=3276
- LiF, elastic limit 3=15981
- LiF, tensile strength, effect of defects 3=25641
- LiF, tensile strength meas. 3=25640
- Mo oxide, electron microscope invest. 3=3374
- NaCl, dislocations, by X-ray diffr. 3=17748
- NaCl, growth and mechanical properties 3=20804
- NaCl, luminescence 3=20518
- NaCl, tensile strength meas. 3=25640
- NaCl, twist, det. from electron diffractogram dynamic fine structure 3=3275
- Ni, tensile rupture tests 3=6801
- Sn, growth, rel. to heating, u.s. irradi., cooling, pressure 3=23414
- W oxide, electron microscope invest. 3=3374

Curium

- e.s.r. of Cm³⁺ in La ethylsulphate and LaCl₃ 3=13299

Curium compounds

- No entries this year

Current, electrical

- See also Conduction, electrical.

- a.c., l.f., meas. using thermal converters 3=345
- aerials, thin circular loop, current distrib. 3=5853
- ballistic galvanometer to meas. long-period impulses 3=24163
- Corbino expt. using cylindrical mag. field, galvano- and thermomag. effects 3=1925
- current regulation by materials with positive temp. coeff. of resistance 3=25395
- cylindrical system, sine, analogy with plane condenser 3=19162
- d.c. supply, 30A 4kW, using Si components 3=7413
- displacement currents, rel. to magnetic fields 3=12293
- elec. discharge, development calc. 3=14538
- electron beam, linear accelerator, pulse monitor 3=24401
- fluctuations in semiconductors 3=6572
- galvanometers, mean square error, lower bound 3=1580
- ion and electron, saturation, in weakly ionized gases 3=5625
- ion currents $\sim 10^{-10}$ A, secondary-electron multiplier as detector 3=454
- insulator with traps, space-charge-lim. 3=8503
- interfacial phenomena, a.c. methods 3=12065
- magnetic field prod. in multilayer medium 3=14725
- meas., by electrometer, negative feedback circuit 3=5604
- meas. in electron beams at low intensity 3=24355
- meas. in piezoelectric crystals, bridge circuit 3=3974
- measurement, small, pulsed and d.c., integrator, digital 3=19138
- metal contact, tunnel current, quantum oscill. in mag. field 3=22908
- MHD-generator using combustion gases as heat source 3=2117
- Nernst-Ettingshausen generator, non-degenerate semicond. 3=3998
- 1 kW precision current supply 3=19136
- in particle beams, meas. by mag. pickup probe 3=446
- semiconductors, non-ohmic behaviour, acoustoelec. current 3=2876
- semiconductors, space charge limited 3=8501
- solids, space-charge-limited current for one type of carrier 3=10709
- solids, space-charge-limited flow 3=15527
- stabilizer with positive feedback in regulator amplifier 3=21693
- strip conductors with rt.-angle bend 3=9712
- superconducting, metastability, temp. effects 3=21656
- superconducting, tunneling, Al-Al₂O₃-Sn, zero voltage, microwave effects 3=21660
- superconductors, decay, BCS theory 3=1892
- system of currents, calc. of fields and forces 3=21939
- tree, living, during thunderstorm 3=9035
- unit, meas., review, absolute, rel. to international 3=21189

Current, electrical — contd

- Bi, non-ohmic behaviour, acoustoelec. current 3=2876
 CdS crystal plates, oscillations 3=783
 CdS, injection, space-charge limited 3=2907

Curvature measurement

- curve plotting with pulse-height analyser 3=9392

Cyclotron resonance

- Azbel'—Kaner in free carriers 3=10638
 Azbel'—Kaner resonance in semiconductors and semimetals 3=785
 conductivity, electron, polarized e.m. radiation 3=18836
 diamond, millimetre, 70 Gc/s 3=10637
 diodes, emitted electrons, obs. methods 3=9851
 in electron beams, interpenetrating 3=7841
 electrons in Si, relaxation time meas. 3=15580
 free electrons in 3300 gauss field 3=2140
 in ion source, r.f., rel. to theory 3=474
 ionized gases, rel. to ion collision data 3=21697
 in metals, conductivity electron momentum meas. 3=4835
 metal films, model 3=6504
 metal films plasma resonance absorpt. 3=10634
 metals, acoustic, theory 3=8416
 metals, quantum theory 3=15477
 plasma, absorption line shape 3=2003
 plasma, ion, frequency sweep detect., Heliotron B 3=24323
 plasma, ion resonance 3=19291
 plasma in magnetic field of a helix 3=12122
 semiconductors, cyclotron motion of free carrier 3=11022
 semiconductors, quantum transport eqn. treatment 3=15560
 semiconductors and semimetals, Azbel'-Kaner resonance 3=785
 in varying magnetic field 3=2776
 Al, electron effective masses and orbits 3=22693
 Al, 3.6×10^{10} c/s 3=17696
 Bi, Doppler shifted 3=4854
 Bi, hybrid and "tilted-orbit" resonances 3=4853
 Bi, meas. using circularly polarized microwaves 3=4852
 Bi, rel. to electron-gas correl. function 3=6507
 Bi, rel. to Fermi surface models 3=8413
 Bi, surface resistance 3=17697
 Cd_{0.17}Hg_{0.83}Te, in i.r. magneto reflection expts. 3=10938
 Ge, degenerate band holes, quantum effects 3=10771
 Ge, degenerate band, quantum theory 3=20150
 Ge, emissive negative mass 3=10773
 Ge, hot electrons 3=10776
 Ge, of hot electrons in n-type 3=10639
 Ge, magnetoplasma reson., microwave 3=2893
 Ge, saturation 3=17850
 Ge, selection rules rel. to quantum effects 3=6506
 Ge, spectrum calc. for holes 3=8505
 InAs, n-type, 23–24 μ meas. 3=12955
 InSb, n-type, and e.s.r. 3=18133
 KCl rel. to mag. field 3=20149
 N₂—thermal electron collision cross-sections 3=22462
 Pb, at 36 kMc/s 3=6505
 Pb, Fermi surf. invest. 3=6494
 PbTe, Azbel'—Kaner type, rel. to Landau levels 3=10831
 PbTe, n-type, Azbel—Kaner 3=17698
 PbTe, p-type, Azbel'—Kaner resonance 3=784
 Sb, rel. to electron Fermi surface tensor 3=4851
 Si, mm wave relaxation times, low-temp. 3=10640
 Si, selection rules rel. to quantum effects 3=6506
 Si, under uniaxial strain, line shift 3=8414–15
 Sn, Fermi surf. investig. 3=6493
 W, carrier mass ratios, 1.6°K 3=2777
 W 3=22692
 Zn, calc. from first princs. 3=8395

Cyclotrons

- See Particle accelerators, orbital.

Damping

- See also Internal friction.
 acoustic radiation damping 3=16673
 collision damping, electrostatic sound waves in plasma 3=16929

Damping — contd

- isolation mountings, nonlinear, transient behaviour 3=9535
 plasma oscillations 3=4169
 rotation of sphere in viscous liquid 3=23839
 rubber-like materials, mechanical representation 3=18877
 Sr, damping capacity, shear modulus of elasticity 3=1216
 W wire, relaxation damping capacity 3=13329

Data tables

- See Collections of physical data; Tables, mathematical.

Dating

- See Earth, age; Radioactive dating.

Dayglow

- See Airglow.

Decay periods

- See Hyperons, decay observations; Mesons, decay observations; Radioactivity, decay periods.

Decay schemes

- See Hyperons, decay observations, Mesons, decay observations; Radioactivity, decay schemes.

Decomposition

- See Dissociation.

Deformation

- See Bending; Elastic deformation; Plastic deformation.

de Haas—van Alphen effect

- See also Diamagnetism; Magnetic properties, diamagnetic
 electron gas, Thomas—Fermi theory 3=697
 fine structure due to electron spin, observation 3=2743
 metals 3=25218
 oscillatory magnetization, Shoenberg's conjecture 3=8641
 plasma, quantum, for arb. disturbance 3=19231
 sample orienting device for low-temp. and high mag. fields 3=19413
 theory, quasi-particle approx. 3=1638
 transition metals, chromium group, electronic band structure 3=6492
 and u.s. vel., oscill. changes with var. mag. field, Bi, 4° K 3=8402
 Al, electron effective masses and orbits 3=22693
 Al, 35 kG 3=20559
 Au, 4.2°K, 100,000 G 3=23138
 Be, and Fermi surface 3=8401
 Bi₂Te, 3=22939
 Bi₂Te₃, valence band structure meas. 3=25240
 Cs, period var. 3=20557
 Fe, internal magnetic field for conduction electron 3=20558
 Fe whiskers 3=18060
 Mg, for mag. flds. nr. c-axis 3=20155
 Pb, 35 kG 3=20559
 Rb 3=1122
 Rh, osc., due to changeover from isolated to compact electron orbits 3=23137
 Sb, at liquid He temp., 23 kG 3=18059
 Sb, magnetoacoustic oscill., carriers meas. 3=4818
 Zn 3=11029
 Zn; rel. to u.s. absorption coeff. oscills. 3=2723
 Zn—Mn alloy 3=11029
 Zr, in pulsed fields up to 190 kG 3=25502

Demagnetization

- See Magnetization process.

Densitometry

- blackening gradients, electronic detm. 3=16727
 contrast transmission of sinusoidal signal, meas. 3=9633
 microdensitometer for nuclear emulsion track profile meas. 3=534
 microscope, photoelectric scanning 3=16753
 photographic dye images 3=5539

Density

- polymers subjected to density-gradient centrifugation 3=8323
 ZnO, high-pressure polymorph 3=3254
 CdSnAs₂, n-type 3=4920
 gases
 fluctuations, dilute gas 3=14209
 hypersonic flow, dissociated, local atom concn. 3=9487
 interferometric meas., by amplitude, Fabry—Perot etalon 3=21564
 uniform field of force acting on gas 3=7238
 As 3=23838

Density — contd**gases — contd**H₂, para, saturated, temp. var. 3=14424**liquids**

benzene, near critical point 3=21323

flowing, instrument for continuous meas. 3=7183

measurement, float method with continuous

recording 3=3780

paraffins, near meniscus vanishing point 3=21323

As 3=23838

Bi, rel. to temp. near m. pt. 3=3793

D₂O¹⁸ 3=14144GaI—Ga₂I₄—Ga₃I₅ molten system 3=18827

Ge, rel. to temp. near m. pt. 3=3793

H₂—D₂, m.p. to 20.4°K 3=21343H₂, para, saturated, temp. var. 3=14424H₂O¹⁸ 3=14144H₂S, with saturated vapour, rel. to temp. 3=14147He³, molar volume meas. 3=5563

Hg amalgams, rel to composition 3=16604

Sb, rel. to temp. near m. pt. 3=3793

Si, rel. to temp. near m. pt. 3=3793

Te, up to 750°C 3=9436

solidsammonium, metallic 20 × 10⁶ atmospheres 3=21100methane, 20 × 10⁶ atmospheres 3=21100

noble metals, rel. to stacking fault tetrahedra 3=12994

polyethylene single crystals, by pycnometer 3=20766

polyethylenes, temp. depend. 3=13326

Cu—Al alloy, vacancy formation by quenching 3=20868

Cu—Zn—Sb alloys 3=23466

GaAs, 3 samples 3=13392

H₂O, 20 × 10⁶ atmospheres 3=21100

In, bulk and X-ray 3=25731

In, evap. mirror coatings 3=22676

Ne, 20 × 10⁶ atmospheres 3=21100

Pb, bulk and X-ray 3=25731

Pb—In alloys, bulk and X-ray 3=25731

PuC, 42-60 at.% C 3=10431

Sc₂O[SiO₄] 3=13485Sc₂SiO₇ 3=13485

Sn powders, compacted 3=6875

SnTe, meas. rel. to stoichiometry 3=6604

UC powder 3=7079

Xe 3=6480

Density measurement

alpha gauge, for small densities 3=3781

changes, by Archimedes principle, using comparison

specimen 3=9400

flowing cryogenic fluids 3=7183

gases, using single scatt. of electrons 3=3820

hydrometer, Cartesian, for sedimentation analysis 3=7167

liquids, float method with continuous recording 3=3780

metals, small changes, rel. to point defects 3=22722

plasma, optically thin, spectral meths. 3=7577

plasmas, spectroscopic 3=9806

by radioactive isotopes, sensitivity and accuracy 3=9396

solids, press. dep. by u.s. interferometer 3=223

ultrasonic, for liquids, meter 3=14089

GaAs 3=13392

Detonation

See also Explosions; Shock waves.

Chapman—Jouguet hypothesis, investig. by "inverse

method" 3=16700

condensed explosives 3=20992

development, temp. meas. by spectral-line

reversal 3=14246

explosives, liquid, crit. dia. 3=9548

flame accel. in transition from combustion 3=3392

gaseous, laminar, generation structure 3=18895

gases, wave velocity meas. with inter-

ferometer. 3=198

n-heptane—air mixtures in shock waves 3=20991

in magnetohydrodynamic medium, with motionless

piston 3=2116

Navier—Stokes soln., very fast reactions 3=21487

nitromethane, light 3=8962

propagation of waves in gaseous HN₃ 3=3850propane—O₂—N₂ mixtures, speed of detonation 3=3395

shock and hot spot initiation, theory 3=11348

Detonation — contd

transmission in water, luminosity 3=21379

water, pressure meas. rel. to eqn. of state 3=1751

wave structure near hot boundary 3=18896

waves, magnetohydrodynamic, structures 3=4254

Deuterium

adsorptn. on carbon black 3=1377

atmospheric content. 3=25892-3

atom, Lamb shift of ground state 3=7328

atoms, prod. in h.f. discharge 3=4032

compressibility, quantum hard-sphere model 3=21434

crystal structure by neutron diffraction 3=1319

diffusion in Al, by d + d → He³ + n 3=17352diffusion of He⁴ with DT, thermal 3=21430

discharge electric, l.p., as neutron source pulsed, very

rapid, fast 3=19659

electron collision cross-sections in d.c. field 3=23942

electron diffusion—mobility coeffs. ratio 3=4023

elec. discharge, r.f., ion cyclotron waves 3=7622

enrichment in distillation of ammonia 3=8940

free radicals, in solid films, prod. by p and d bombard-

ment, 100-1000 V, e.p.r. 3=10550

gas discharge tube, higher intensity than H 3=24232

ion sputtering of Ti, 10 to 25 keV 3=449

liquid, in soln. with H₂, density, m.p. to 20.4°K 3=21343

liquid, target, for 1 GeV proton synchrotron at

Birmingham 3=14692

melting, pressure—temperature eqn. 3=12000

molecule, elec. charge, upper limit 3=10091

molecule, neutron scatt., quantum states

transition 3=25074

natural water content variation. 3=25898

permeation rate through Fe 3=22815

photochemistry, reactions of Hg6(³P₁) with hydrocarbons,

isotope effect 3=8973

 π^0 -meson photoproduction at 170 to 210 MeV 3=4427

plasma, cylindrical, hydromag. wave propag. 3=19291

plasma, electron density, interferometric meas. 3=7582

plasma, from high vel. plasma guns 3=7520

plasma, high-temp. in Scylla, X-ray emission

spectra 3=7581

plasma, highly-ionized, steady-state, development and

study 3=7498

plasma, hot, production and containment 3=12150

plasma, n energy spectrum, cyclotron heated, mag.

mirror 3=19913

plasma oscillations, frequency det. 3=2004

plasma, transport props. 3=16926

rain water content. 3=25897

shock wave, e.m. driven, R-type ionization front 3=7277

solid, para-enriched, λ -anomaly in specific

heat 3=2732

in solution with H, solid—liquid phase diagrams 3=21612

target for electron accelerator 3=14688

thermal diffusion, with trace of HT 3=11818

thermodynamic props. calc. 3=23929

thermodynamic props., -175°C to 150°C, up to

2500 atm. 3=23930

-CH₄ mixtures, n irradi., failure of T elastic collision

model 3=18460

D⁺ formation in D₂⁺—D₂ collisions 3=15391D⁻ ion source, 2mA beam 3=14667D⁻, 20 MeV, electron detachment by mag. field 3=24213D₂ and H₂ + Xe powerful impulsive discharges, electron

energy meas. 3=7452

D₂, C¹H₁(2p) state Λ doubling, isotopic effect 3=2614D₂, heterogeneous perturbations between B¹ Σ _u⁺(2p) andC¹H₁(2p) states 3=2613D₂ vapour, Townsend coeffs. and Paschen's law break-

down 3=4010

K⁻-meson capture, charge independence, theory 3=608

Ne—nD, liquid systems, phase separation 3=3801

Deuterium compounds

See Hydrogen compounds.

Deuterons

See also Cosmic rays, deuterons; Nuclear reactions,

deuterons.

angular distrib., from Li⁶(α ,d), for 24.5, 23.7 MeV α 's 3=22427

charge asymmetry, nuclear stripping reactions 3=10380

Compton effect, 190-250 MeV, cross-sections 3=2233

Deuterons — contd

- disintegration by nucleon impact 3=24806
 eightfold way, place in group SU (3) 3=24604
 electrodisintegration, rescattering correction 3=2326
 emulsions, discrim. from protons 3=4304
 form factor, from coherent π^0 photoprod. 3=10178
 form factor, dispersion representation 3=4470
 form factor, dispersion theory, correction 3=17354
 form factor, dispersion theory, in e-d scatt. 3=2329
 form factors, from e-d scatt. 3=14959
 form factors, from impulse approx. 3=17353
 form factor, inelastic 3=19712
 ground-state functions, rel. to nucleon core 3=4383
 magnetic and elec. quadrupole moments 3=15016
 neutron-proton interaction, mag. dipole theory 3=4398
 neutron scatt. at 0.5-1.95 MeV, polarization and diff. cross-section 3=587
 optical models 3=4663
 photodisintegration, dispersion relations 3=612
 p-i-n detector, particle discrimination 3=17115
 polarized beam production 3=10374
 prod. by p, at ~ 28 GeV, with mass-3 nuclei, high energy, momentum spectra, theory 3=15198
 production by γ -rays in He^4 3=15052
 production by 30 GeV protons on Al, Be, Fe 3=6090
 production in carbon and polyethylene by 26.6 GeV/c protons 3=24717
 production in proton bombardment of matter, 25-30 BeV 3=6253
 radial-ridge cyclotron, 12 MeV beam 3=5731
 scintillation counting, nuclear interact. correction 3=12518
 source, pulse, with low gas expenditure 3=4206
 virtual state, Lee model application 3=12512
 wave function, S and D states 3=22216
 D(d,n) He^3 , self-target in Au 3=12514
 $\text{Fe}^{56}(\text{n}, \text{d})\text{Mn}^{55}$, ang. distrib. 3=19865
 Li(γ ,d), 160-260 MeV 3=2436
 Li $^6(\text{p}, \text{pd})$, 155 MeV, calc. 3=22386
 O $^{16}(\gamma, \text{dp})\text{C}^{13}$ 3=15178
 in Si, range-energy relationship 3=17113
 V $^{51}(\text{d}, \text{d})\text{V}^{51}$, ang. distrib., 8-10.5 MeV 3=15220

effects

- free radicals, on bombardment, in H_2 , D_2 , solid, films, e.p.r., 100-1000 V 3=10550
 metals, review 3=4895
 Al, below 8.5°K, isothermal annealing 3=13021
 Au, below 8.5°K, isothermal annealing 3=13021
 CaF $_2$, high-purity crystals, coloration 3=6541
 LiF, coloration, rel. to growth method 3=25298

interactions

- capture, radiative, by H^3 , 150-1300 keV 3=17356
 disintegration on D, T, He^3 , at 9 MeV, neutron spectra 3=2327
 electrodisintegration, final-state interact. 3=17351
 in emulsion, 275 MeV, mean free path 3=24808
 neutron as "spectator" above 1 BeV/c 3=17269
 nucleon-deuteron breakup, Chew-Low extrapol. 3=17355
 on D and T, neutron yields 3=19652
 D—D, at 9 MeV, neutron spectra 3=2327
 D(d,n) He^3 , neutron polarization 3=24807
 d(d,p), 120-200 keV, proton ang. distrib. 3=22218
 D— He^4 , at 9 MeV, neutron spectra 3=2327
 d—K $^+$, cross-sections 3=19696
 d—K $^+$, rel. to parity detm. 3=4462
 d + d $\rightarrow \text{He}^4 + \pi^0$, upper limit search 3=15046
 d + d $\rightarrow \text{He}^3 + \text{n}$, Al "self-target", n yield, diffusion 3=17352
 D(p, γ) He^3 , below 50 keV 3=15045
 d + p $\rightarrow \text{He}^3 + \text{X}$ rel. to π - π , I = 0 resonance 3=4430
 d + p $\rightarrow \text{He}^3 + \pi + \pi$ 3=17318
 d + $\Sigma^- \rightarrow \Lambda + 2\text{n}$, Λ momentum distrib. 3=24803
 d— π^+ , rel. to 3π , I = 0 resonance 3=4430
 D—T, at 9 MeV, neutron spectra 3=2327
 D—T breakup reaction, virtual state of He^4 3=2331
 p + d $\rightarrow \text{H}^3 + \pi^+ + \pi^0$, H^3 spectrum 3=4390
 p + D $\rightarrow 2\text{p} + \text{n}$, 5-10 MeV, proton spectra 3=19711
 p-d, 77 MeV, cross-sections, total and elastic 3=12316
 $\Sigma^- + \text{d} \rightarrow 2\text{n} + \Sigma^0$ or Λ , low-energy calc. 3=10176
 $\Sigma^- + \text{d} \rightarrow 2\text{n} + \Sigma^0$ or Λ , transition rates 3=10177
 T(d,n) He^4 , neutron polarization 3=676

Deuterons — contd

photodisintegration

- calc., multipole expansion, 50-120 MeV 3=12515
 deuteron photodisintegration 3=612
 e.m. transitions, 162-833 MeV, theory 3=7937
 γ - 3π interaction study 3=15016
 and mesonic effects, search 3=12513
 neutron polarization meas. 3=15044
 π^- production 3=4424
 proton polarization due to 294 MeV photons 3=22217
 near threshold, final-state interaction 3=19710
 between 50 and 150 MeV 3=4471

polarization

- electric, calc. for several wavefunctions 3=4472
 Fe, elastic scatt. at 6.5 MeV 3=22416
 Ni, elastic scatt. at 6.5 MeV 3=22416
 Ti, elastic scatt. at 6.5 MeV 3=22416

scattering

See also Protons and antiprotons, scattering, proton-deuteron.

- A var., 11.8 MeV 3=22415
 D—D, elastic, high-energy, impulse approx. 3=2328
 d-d, 20-70 MeV, total cross-section 3=12517
 d-n doublet scatt. length, upper bound 3=19638
 d-n, 1.0 MeV, neutron polarization 3=19637
 d— π^\pm , 300 MeV 3=17322
 e-d, low momentum transfer, deuteron, form factors 3=14959
 e-d, low momentum transfer, neutron form factors 3=19612
 d-p, 77 MeV, cross-sections 3=22129
 by e, from D form factors, from impulse approx. 3=17353
 by e, dispersion theory, correction 3=17354
 elastic, 15 MeV, by 23 elements 3=15221
 elastic and inelastic in cyclotron of Ukrainian Acad. of Sciences 3=19880
 elastic, optical model including tensor potentials 3=10375
 electron, elastic, rel. to deuteron form factor 3=2329
 N—d, phase shift ambiguity 3=24736
 n-d, three-body formalism 3=19641
 n-d, threshold effects due to di-neutron 3=22137
 with neutrons, elastic, theory 3=10108
 nuclei, complex, high-energy theory 3=12698
 nuclei, elastic, effect of nuc. elec. field 3=4663
 nuclei, with deformation of arbitrary multipolarity 3=4661
 optical potential ambiguities 10-30 MeV 3=22361
 p-d, 77 MeV, cross-sections, total and elastic 3=12516
 p-d, 24-35 MeV, d disintegration 3=24806
 π -d, elastic, 142 MeV, form-factor approx. 3=22180
 π^- -D, 142 MeV, elastic and inelast. 3=22179
 rare-earth isotopes, inelastic, rel. to rotational levels 3=17458
 theory, inelastic 3=19712
 Ag, 11.8 MeV, elastic, meas. 3=17490
 Be, elastic, 12.8 MeV meas. 3=22412
 C, elastic, 12.8 MeV meas. 3=22412
 C 12 , elastic, excitation curves 3=17400
 C 12 , elastic 3=8128
 C 12 , 6.0-11.8 MeV, elastic 3=22413
 Ca, elastic, 12.8 MeV meas. 3=22412
 Ca, elastic, 22 MeV polarized beam, asymmetries 3=10374
 Cr 52 3=4665
 Fe, inelastic, at 13.6 MeV 3=6285
 Fe, 6.5 MeV, elastic, ang. distrib. 3=22416
 He^3 nuclei at 29 MeV, elastic 3=7860
 He^4 , above 1 BeV/c, and n polarization 3=17269
 He^4 , elastic, at 6-14 MeV, diff. cross-sections 3=611
 He^4 , elastic, 24.85 MeV 3=19713
 Mg, elastic, 12.8 MeV meas. 3=22412
 Nb, 11.8 MeV, elastic and inelast. 3=17490
 by Ni 58 , 12.8 MeV 3=6282
 by Ni 60 , 12.8 MeV 3=6282
 Ni $^{58, 60, 62, 64}$, elastic, 13.6 MeV 3=6284
 Ni $^{58, 60, 62}$, inelastic, 15 MeV meas. 3=6281
 Ni $^{58, 60, 62, 64}$, inelastic, 13.6 MeV 3=6283
 Ni, 6.5 MeV, elastic, ang. distrib. 3=22416
 O 16 , elastic, 8.0-10.5 MeV 3=24962
 O 16 , 0.65-2.0 MeV, elastic 3=22414
 Pb, 11.8 MeV, elastic, meas. 3=17490

Deuterons — contd

scattering — contd

- by S, 11.8, 10.9, 10.0 MeV 3=19873
- by Si, 11.8, 10.9, 10.0 MeV 3=19873
- Si, 13.6 MeV, inelastic 3=6285
- Sr, 11.8 MeV, elastic and inelast. 3=17490
- Sr, inelastic 3=4662
- Ti, inelastic, at 13.6 MeV 3=6285
- Ti, 6.5 MeV, elastic, ang. distrib. 3=22416
- by V, 8-10.5 MeV, elastic 3=15220
- Y, inelastic 3=4662
- Zr, 11.8 MeV, elastic and inelast. 3=17490

Development, photographic

See Photographic process, development.

Diamagnetism

See also Cyclotron resonance; de Haas-van Alphen effect; Magnetic properties, diamagnetic.

- anisotropic, crystals 3=8640
- anisotropic props. of carbonate and nitrate ions 3=10495
- conduction electrons in weak-binding approx. 3=25500
- diatomic molecules, susceptibility, calc. 3=10494
- electron gas, free, using free energy 3=3769
- electron gas, orbital suscept. of local perturb. 3=20556
- fluids, mag. birefringence, mol. theory 3=3815
- metals, diamag. shielding of nuclei, theory 3=2750
- molecular-orbital theory 3=8240-1
- molecular orbital theory 3=10495
- molecules, from one-centre wavefunctions 3=17585
- neutral atoms, Thomas-Fermi model 3=4702
- paramagnetic resonance line splitting effects 3=23221
- plasma, quantum, for arb. disturbance 3=19231
- polaron in uniform mag field, free energy 3=2769
- semiconductors with nonparabolic bands 3=23139

Diamonds

- abrasion hardness, effect of neutron irradi. 3=3248
- absorption, light, u.v., and i.r., vibr. freqs. and specific heat 3=18003
- allotropic conversion, at 3000°C, graphite orientation 3=20776
- band structure calc. 3=20135
- colour changes when irradiated 3=20252
- conduction band, plane-wave calc. 3=777
- conference, Paris 1962 3=12889
- covalent bonds, simplified tight-binding approx. 3=22622
- crystal statistics of Ising model 3=12898
- cyclotron resonance, millimetre, 70 Gc/s 3=10637
- direct conversion from graphite in static pressure apparatus 3=8793
- dislocations and vacancies 3=17731
- electroluminescence, types I and IIa 3=964
- electron excited states, many-electron model 3=778
- electronic states of single interstitial atoms 3=10620
- e.s.r. of electron-irrad. IIa diamonds rel. to defects 3=6746
- etch pits on (111) and (100) faces 3=1259
- fracture, cleavage, review, defect effects 3=23362
- from graphite, conversion 130 kilobars, 3300°K 3=6819
- graphitization, surface orient. effect 3=13398
- hardness 3=25645
- hexagonal polymorphism, possibility 3=3298
- imperfection photoconductivity 3=2975
- imperfections in types I and II 3=2783
- insulating and semiconducting 3=22944
- Ising model, low-temp. expansions 3=10198
- lattice vibration study by i.r. absorption 3=10577
- lattice vibrations and interatomic forces 3=8349
- metallic, theory 3=12895
- optical phonon effects in absorption and photoconductivity 3=10933
- periodic potential, Fourier coeffs. calc. 3=6455
- powder, particle size analysis, comparison of methods 3=23825
- prod. in laboratory 3=5080
- replication of freezing metal structures 3=8811
- semiconducting 3=22943
- sliding on lead, frictional force 3=13388
- slip lines due to distortion during crystal growth 3=25285
- spectra, i.r. absorption, of type I 3=10928
- spectrum, i.r., review, Raman's work 3=23069
- structure stability under high-pressure 3=23375
- surface structure, atomically clean 3=11312

Diamonds — contd

- synthetic, cleavage and etching 3=13406
- synthetic, growth and etch phenomena 3=3266
- synthetic, spirals on (100) faces 3=25661
- synthetic, triangular pyramids on octahedral faces 3=23381
- synthetic, types I and II 3=8595
- thermal expansion anomalous negative low-temp. values 3=10603
- thermoluminescence, thermal rel. to optical activ. 3=20547
- type IIb, lattice absorption of light 3=928
- vacancies, single, electronic states 3=786
- vacancy structure, e.s.r. investigation 3=17710
- valence band, l.c.b.o. method 3=779

Dichroism

See Pleochroism.

Dielectric devices

- amplification props. of filament 3=17071
- bibliography 3=13102
- bolometer, ferroelectric, for moon obs. 3=16349
- capacitors; oxide layer deposition by sputtering 3=2050
- ceramics, BaTiO₃, for fine movement control 3=7418
- condenser, nonlinear, discharge 3=12060
- condenser with polar dielectric, potential fluctuations 3=24204
- dielec. corona motor 3=10161
- electroscope, large, demonstration 3=12062
- insulating film, nonuniform, bet. electrodes, tunnelling 3=23011
- junction, asymmetric. elec. tunnel effect 3=23010
- metal-insulator-metal potential barriers 3=9709
- mirrors, metallic-dielec., for interferometers 3=3889
- tunnel junctions, generalized current-voltage formula 3=15626
- BaTiO₃, double space charge injection 3=13128
- CdS, dielec. diode using space-charge effects 3=861
- CdS diodes, injection currents space charge, limited pulse and d.c. 3=15602

Dielectric measurement

- absorption meas., thermal method 3=14468
- bibliography 3=13102
- bridge, automatic, large frequency band 3=24155
- capacitance-conductance bridge 3=21682
- cavity method for microwave freq. 3=19128
- decimeter wave device 3=12061
- ferrite-like toroids, complex dielectric constant meas. 3=9710
- ferrites, weak-field permeability and dielectric constant, apparatus 3=21679
- frequencies < 500 c/s 3=8551
- on glass, non-polarizing electrodes 3=19129
- insulators, accelerated life tests 3=16899
- line length variation method 3=24157
- liquids, cell with concentric Pt cylinders 3=3990
- at microwave freqs. 3=14469
- permittivity, complex, with Q meter 3=14471
- permittivity of glow discharge 3=19216
- permittivity, spiral waveguide method, limits 3=21675
- polarizability analysis 3=3992
- polymers, apparatus for meas. of complex const. 3=3991
- polymers, const., complex, 1-100 c/s, bridge 3=19130
- powdered organic semiconductors 3=8557
- RC method, feedback network 3=14466
- sample holder for ferroelec. materials up to 700°C 3=7420
- standard selection, at microwave frequency 3=13103
- waveguide method for low-loss liquids 3=21676

Dielectric phenomena

- See also Electric strength.
- anisotropic crystals, permittivity, theory 3=2767
- antiferroelectric dipole structure patterns 3=22991
- associated liquids, dielec. and mechanical relaxation 3=21390
- bibliography 3=13102
- breakdown mechanism, brittle dielects. 3=901
- breakdown mechanism, brittle dielects. 3=6620
- breakdown, thermal, two-layer plate 3=8564
- Cherenkov radiation and supplem. waves 3=17240
- condensed molecular systems, dipole polarization, modern theories 3=17925
- corona discharge, behaviour of gas-filled voids 3=7472

Electric phenomena — contd

- crystals, second harmonic generation of light 3=1839
- cubic ionic cpds., temp. and press. depend. 3=8546
- dielectric friction of rotating dipole 3=12295
- dielectric friction on a moving ion 3=12294
- dipole assembly on vibrating lattice, equil. approach 3=2715
- dipole chain, linear, relaxation properties, applic. liquids 3=21387
- dipole structure, from ferroelectric active ion concept 3=25394
- dispersion forces, retarded, at finite temps. 3=20368
- elec. current due to γ -irrad., mechanism 3=4950
- electric dipole relaxation, theory 3=22530
- electrolytes, weak, solns., rel. to dissociation 3=5447
- electron beam transmission through dielec. tubes 3=9858-9
- electron gas, degenerate, corrected theory 3=7146
- electron gas, props., correlation effects 3=73
- electron plasma, permeability tensor, quantum theory 3=402
- e.m. waves scatt., Luneberg-Kline analysis 3=7704
- ferromagnetic, absorpt. of a.c. mag. field, longit. 3=8662
- ferromagnetic, absorpt. of a.c. mag. field, non-reson. 3=8661
- films, vacuum deposition and behaviour 3=16898
- fluids, dense mixtures, Lorentz-Lorenz function 3=1709
- gyroelectric media, plane-wave propag. 3=3896
- gyroelectric media, reflection theory 3=11925
- insulator with conducting inclusions, dielec. const. and conductivity, freq. depend. 3=22971
- insulators, rel. to collective excited states 3=2944
- interaction with resonant cavity 3=14776
- interactions in polar media, interparticle interaction energy 3=9472
- interactions in polar media, statistical mechanical treatment 3=23894
- ionization of local levels by elec. fields 3=15453
- liquids and dense gases, polarizability change by many-body interact. 3=1705
- liquids, dipole relaxation times, molecular reorientation 3=21302
- magnetoelectric media, tensor relns. and wave propag. 3=2855
- many-electron system, including local field effects 3=4937
- Maxwell-Wagner effects in model systems 3=21691
- measurement, resonator, component of multilayer cylinder 3=21677
- mixtures, second virial coeff. of refract. 3=3835
- nonlinear optical processes in insulators 3=927
- nonpolar fluid, theory of dielec. const. 3=16575
- permittivity meas., 8 mm, by shorted-line wave-guide 3=22973
- plasma, inhomog., contained, theory 3=21787
- plasma, rel. to Coulomb interaction 3=7509
- plasma with population inversion, tensor dielec. suscept. 3=8202
- polar liquids, movement in elec. fields 3=3812
- polar molecules, cluster expansion methods 3=10552
- polarization and permeability non-linearity 3=25389
- polarization by nuclear radiation 3=17923
- polarization e.m.f., high voltage, superposition effect 3=15607
- polarization waves in solids 3=25388
- polyelectrolyte solns., interaction of neighbouring charged groups 3=21345
- porous media impregnated with conducting liquid, coherence phenomena 3=20374
- progress review, book 3=22970
- quadratic response functions, quantum theory 3=15606
- radiation effects, reversible, rel. to structure 3=15609
- relativity theory 3=1607
- relaxation in high-temp dipole lattice 3=16543
- relaxation, short range dipole-dipole interact. 3=8542
- relaxation, temperature-frequency analysis 3=3993
- semiconductor, dielec. const. calc. by intrinsic activation energy 3=847
- semiconductors, dielectric function, wave-number dependent calc. 3=8577
- semiconductors, hot carrier, freq. depend. 3=13048
- solids, corona discharges in, analysis 3=4104
- sound absorption in ferromagnetics, theory 3=22654

Dielectric phenomena — contd

- space-charge polarization in photocond. insulators 3=15627
- superconductor, BCS model calc. 3=9676
- tunnel effect between electrodes sep. by insulating film 3=23010
- tunnelling, effect of insulating film-nonuniformity 3=23011
- CdSe, negative photodielectric effect, 20° and -180°C 3=10889
- ferroelectric**
See Ferroelectric phenomena.
- Dielectric properties of substances**
See also Electric strength.
- bibliography 3=13102
- electron gas, in space-periodic field 3=782
- glycerine containing H₂O or gelatine, dielectric const., 100 Mc/s-15 Gc/s 3=21391
- insulating layers, polarization, rel. to electron irrad. 3=20371
- nitrobenzene-water emulsions, effect of shear 3=3414
- oil-water emulsions, effect of shear 3=3414
- permittivity, r.f., substitution bridge meas. 3=14477
- plasma, longitudinal dielec. const. 3=14564
- plasma, rel. to Lorentz polariz. term 3=4112
- progress review, book 3=22970
- water-oil emulsions, effect of shear 3=3414
- COCl₂ in gas, liquid, & solid state. 3=177
- KNbO₃ 3=16033
- gases**
inert gases, meas. over wide temp., pres., range 3=7313
- plasma, afterglow, const. meas. 3=7550
- plasma, complex tensor 3=21769
- plasma, relativistic isotropic, spatial dispersion 3=4127
- He, dense, polarizability change due to many-body interact. 3=1705
- NH₃, radioelectric meas. 3=3838
- Xe, dense, polarizability change due to many-body interact. 3=1705
- liquids and solutions**
acetic acid in very dilute solutions, polarizations 3=21394
- acetone solns., in various solvent, structure study 3=21386
- alcohols, relaxation, rel. to viscosity 3=21398
- alcohols, tertiary, polarization, rel. to intermolec. association 3=21396
- anisaldazine liquid crystal, effect of elec. and mag. fields 3=11803
- aromatics, with methoxy groups, 2.2 mm, 20-80°C 3=21389
- benzene-chloroform-hexanol-1 mixtures, saturation 3=23895
- α -bromonaphthalene, relaxation and dipole-dipole interaction 3=23897
- butanediol 1,3, relaxation, rel. to association 3=1704
- chlorobenzene-nitrobenzene, relaxation phenomena 3=21392
- α -chloronaphthalene, relaxation and dipole-dipole interaction 3=23897
- colloids in electrolyte soln., l.f. dispersion 3=13627-8
- cyanoacetylene 3=7216
- dibutyl phthalate, relaxation and dipole-dipole interaction 3=23897
- dielectric friction on a moving ion 3=12294
- diols, with branched chains 3=21397
- dipolar, in rotating elec. field, mechanical moments 3=18826
- dipole moment, effect on elec. potl. of falling drops 3=7217
- egg albumen, dispersion, u.h.f. 3=14177
- electrolyte solutions, solvent dielec. const., effect on viscosity 3=21341
- electronic structure, liquid insulators 3=21384
- ethyl alcohol, at mm wavelengths, rel. to dispersion 3=1706
- ethyl benzoate, relaxation and dipole-dipole interaction 3=23897
- ferrite-paraffin oil, effect of ultrasound 3=9471
- glycerine-paraffin oil, effect of ultrasound 3=9471
- glycerol, relaxation, rel. to association 3=1704
- hexane, breakdown mechanism 3=23900

Dielectric properties of substances — contd

liquids and solutions — contd

- hexanetriol 1, 2, 6, relaxation, rel. to association 3=1704
- n-hexanol, orientation polarization, rel. to solvent 3=21395
- hydrocarbons, liquified gases, conference, Durham, 1963 3=18824
- isoamyl phthalate, relaxation and dipole-dipole interaction 3=23897
- low-loss liquids, dielec. const., 8.2-12.4 Gc/s 3=21676
- meas., const. and loss, resonator, useful formulae, approx. 3=21678
- methyl alcohol, at mm wavelengths, rel. to dispersion 3=1706
- 2-methyl pentanediol 2,4, relaxation, rel. to association 3=1704
- monochlorobenzene-paraffin oil, effect of ultrasound 3=9471
- movement of polar liq. in elec. fields 3=3812
- nitrobenzol solns., in hexane, structure study 3=21386
- organic cpds., Debye dipolar absorption, rel. to phase changes 3=22987
- organic liquids, H bond effects 3=21385
- organic phosphates, dipolar absorpt. 3=18825
- organic solvents, saturation, rel. to intermolec. rotation 3=21393
- polar liquids, interparticle interaction energy 3=9472
- polar molecules in soln., relaxation times, calc. 3=1708
- polarizability analysis 3=3992
- polyvinyl pyrrolidone soln. 3=16635
- polyvinylamine hydrochloride soln. 3=16635
- 1-propanol-2-methylpentane, relaxation meas. 3=23898
- relaxation time, dipole-dipole interact., dilute solns. 3=23896
- relaxation time, Eyring's equation, and dipole-dipole interaction, meas. 3=14175
- relaxation times in dil. soln., test of theory 3=1707
- relaxation times in soln., calc. for polar molecules 3=1708
- silicone oil films, 350-5000 Å, insulation 3=21388
- water, dipole orientation, rel. to viscous flow 3=21399
- water-in-oil, emulsion, agglomeration, from shear and rest const. 3=13621
- water, polarizability, temp. var., from refractive index 3=23899
- H₂BO₃ aq., loss, chem. relax. effects 3=5447
- H₂O, Onsager's equation, refr. index choice 3=14176
- He, use for level indication 3=21648

solids

- alkali halides, high freq. and temp. rel. to point defect interaction 3=22974
- alkali halides, polarization and a.c. capacity 3=22977
- alkali halides, rel. to impurities and vacancies 3=22760
- ammonium fluoboroyllate, domain structure detect. 25401
- anthracene, photodepolarization, polarity, in fundamental absorpt. band 3=17908
- breakdown of gaseous inclusions 3=1939
- casein hydrate, permittivity at hyper-frequencies 3=22988
- cellulose, dry 3=20377
- ceramics, new materials, development, review 3=20370
- crystals, ideal ionic and valence, polarization theory, present state 3=15608
- crystals, permittivity, depend. on freq. and wave vector 3=17922
- dielectric const. det. from reflectance ratios 3=6640
- dielectric-metal mixtures at microwave freq. 3=10868
- dielectric-metal mixtures, microwave region 3=22986
- e.m. wave propag. in active slab 3=24465
- ferrites, microwave, at high temps. meas. 3=22978
- films, constant, by electron scattering, inelastic 3=20962
- glass, elec. cond. 3=20372
- glass with adsorbed water, v.l.f. behaviour 3=17950
- glasses, losses, 8 mm, 20-400°C 3=20373
- guanidine Al sulphate hexahydrate, const., up to 23 kMc/s 3=23005
- guanine, -120°C to +100°C 3=866
- gypsum, anisotropy, in 3 cm microwave band 3=25391

Dielectric properties of substances — contd

solids — contd

- heulandite, dispersion f < 500 c/s 3=8551
- hydrogen-bonded materials, saturation effect 3=22972
- ice, conductivity, -150 to -80°C, ~50 kV 3=22980
- ice, dispersion, rel. to lattice defects 3=10644
- improvement, by adding crystalline quartz 3=8544
- "inner field" theory 3=8541
- insulating films, bet. electrodes, intrinsic fields 3=8543
- internal dielec. const., lattice effects 3=13104
- losses, in heulandite, f < 500 c/s 3=8551
- metals, microscopic expression for dielec. const. 3=25250
- naphthalene, photodepolarization 3=17908
- new materials for electronics applications 3=20369
- organic cpds., Debye dipolar absorption, rel. to phase changes 3=22987
- organic phosphates, dipolar absorpt. 3=18825
- organic semiconductors, powders 3=8557
- oxide films, space charge, rel. to growth 3=10867
- paper, anisotropy, oriented fibres, 3000 Mc/s 3=22990
- paraelectric materials, temp. dependence of permittivity 3=8547
- phenanthrene, photodepolarization, polarity, in fundamental absorpt. band 3=17908
- polyethylene, diffusion recombination 3=20379
- polyethylene, oxidized, high-pressure, dispersion 3=22989
- polymers, conductivity, rel. to irradiation 3=20378
- polymers, in amorphous substance, polarization, theory 3=17928
- porcelain, permittivity, variation with temp. 3=2953
- Portland cement paste 3=22982
- quartz, crystalline and fused, rel. to temp. 3=25392
- quartz, current substituting Ag⁺ for Li⁺ ions, pot. 3=17788
- quartz, loss, l.f., at low temp. and imperfections, colour centres 3=20157
- quartz, on fast n irradi. 3=17929
- quartz, second harmonic generation of light 3=1839
- Rochelle salt, dielec. permittivity, effect of Cu²⁺ doping 3=25404
- Rochelle salt, ultra-high frequencies 3=20385
- rock salt, temp. of breakdown 3=25408
- rocks, equiv. cct.determ. 3=19135
- rocks, temp. depend. of dielec. const., loss 3=23574
- rutile, non-stoichiometric, meas. and model 3=2955
- rutile (TiO₂), polarization and space-charge-limited currents 3=895
- sapphire, dissipation factor anomaly 3=15612
- semiconductors, IV and III-V groups, u.v. dielec. const. 3=10908
- shellac wax electret 3=25410
- silica gels, microwave and dipolar spectra 3=22984
- sitals of cordierite system, for u.h.f. 3=25293
- space charge, conference report 3=4935
- steatite, permittivity, variation with temp. 3=2953
- stilbene, photodepolarization, polarity, in fundamental absorpt. band 3=17908
- superconductors 3=19098
- III-V compounds, mol. effective charge and atomic polarizabilities 3=17637
- tolane, photodepolarization, polarity, in fundamental absorpt. band 3=17908
- triglycine sulphate const., up to 23 kMc/s 3=23005
- triglycine sulphate, 100 c/s to 3 Gc/s 3=20386
- triglycine sulphate, rel. to γ-irrad. 3=25406
- zeolites, microwave and dipolar spectra 3=22984
- AgBr, Ni-doped, loss-factor meas. 20°-200°K 3=8554
- AgCl, Debye effect in u.v., temp. depend. 3=2948
- AgCl, photoelectret state formation 3=15623
- Al/Al₂O₃/Sn system, polar tunnelling characteristics 3=8543
- Al₂O₃ films, current flow, mechanism 3=22976
- Al₂O₃, hydrated, 100 c/s-100 kc/s meas. 3=4938
- γ-Al₂O₃, sorbed H₂O relax. and resonance phenomena 3=22975
- Al₂O₃ thin films 3=8555
- Ba(NiW)_{0.5}O₃ dielec. const. 3=8864
- BaS, meas. at 7.25 Mc/s 3=17932
- BaTiO₃, breakdown, Al and Au electrodes 3=2962
- BaTiO₃, ceramic, losses at low freqs. 3=14468
- BaTiO₃, coercive field rel. to thickness 3=20381

Electric properties of substances — contd**solids — contd**

BaTiO₃, constant rel. to temp. 3=4945
 BaTiO₃, dielec. loss, X-irrad. 3=968
 BaTiO₃, microwave dielec. dispersion, mechanism 3=25398
 BaTiO₃, dielec. absorptn. 3=894
 BaTiO₃, polycrystalline, $\Delta\epsilon$ anomalous delay effect 3=15617
 BeO crystals, polar character 3=10884
 BeO films, current flow, mechanism 3=22976
 Bi borate glasses 3=891
 CaS, meas. at 7.25 Mc/s 3=17932
 CaSO₄·2H₂O 8 mm, by shorted-line waveguide 3=22973
 CdAs₂, dielectric ions, 4-2°K, l.f. 3=8549
 CdF₂, conversion from insulator to semiconductor 3=8522
 CdS, meas. and model 3=8556
 CdSe, meas. and model 3=8556
 CdTe, meas. and model 3=8556
 Ce aluminates, high permittivity 3=6617
 CeO₂ thin films 3=8555
 Cr₂O₃, at 1kc/s and 2 Mc/s, meas. 3=8548
 Fe₃O₄- γ -Fe₂O₃- α -Fe₂O₃, 10³-4 × 10⁴ c/s 3=18071
 GaAs, real and imag., from optical data 3=8584
 GaP, real and imag., from optical data 3=8584
 Ge, real and imag., from optical data 3=8584
 InAs, real and imag., from optical data 3=8584
 InSb, real and imag., from optical data 3=8584
 K halides, from optical refl. data 3=25433
 KBr, coloured crystal, diel. relaxation 3=6613
 KBr 8 mm, by shorted-line waveguide 3=22973
 KCl 8 mm, by shorted-line waveguide 3=22973
 KD₂PO₄, Curie point and dielec. const. 3=17943
 KD₂PO₄, paraelec. response meas. 3=10871
 KH₂PO₄, complex at 9.2 Gc/s 3=8553
 KH₂PO₄, second harmonic generation of light 3=1839
 KTaO₃, near Curie point 3=17936
 LiF, effect of X-ray irrad. and heating 3=8479
 LiF 8 mm, by shorted-line waveguide 3=22973
 LiF, relaxation meas., rel. to lattice defects 3=22702
 LiF with adsorbed water 3=10880
 MgTiO₃, microwave props. 3=13112
 MnLuO₃ and similar manganites 3=13119
 MoS₂, dielec. const. 3=8376
 NaCl, dielec. losses, effect of CO₃²⁻ and OH⁻ groups 3=20375
 NaCl, effect of X-ray irrad. and heating 3=8479
 NaCl, 8 mm, by shorted-line waveguide 3=22973
 NaCl, ionic conductivity and time-dependent polarization 3=10872
 Na(Nb_{1-x}Ta_x)O₃, transitions 3=13394
 NaCl, photoconducting, polarization and elec.-field distrib. 3=10869
 NaNO₂ single crystals 3=23002
 Ni ferrite, resistivity, change on mag., anisotropy 3=17927
 Ni-Zn ferrites 3=4939-40
 Ni-Zn ferrites, rel. to magnetic properties 3=8684
 O¹⁸, in ice, relaxation, and defect, new type 3=6512
 PbCl₂, TlCl or BiCl₃ doped, electrolytic cond. 3=17926
 PbO-TiO₂-ZrO₂ system 3=3255
 PbTe, low freq. dielec. const. 3=13106
 PbTiO₃-BaZrO₃ system 3=13481
 PbTiO₃-LaAlO₃, rel. to phase diagram 3=20767
 PbTiO₃-LaFeO₃ system, temp. and LaFeO₃ conc. var. 3=20852
 Pr oxides, dipole relaxation, rel. to crystal structure 3=8552
 Sb in Ge, solid solubility det. 3=3342
 Se xerographic plate, photoinduced discharge 3=15613
 Si, real and imag., from optical data 3=8584
 Si₃N₄ thin films 3=8555
 SiO thin films 3=8555
 SiO₂ films, 350-5000 Å, insulation 3=21388
 SiO₂ thin films 3=8555
 SnO₂, effect of covalent binding on permittivity 3=17931
 Sr(NiW)₂O₈, dielec. const. 3=8864
 SrS, meas. at 7.25 Mc/s 3=17932
 SrTiO₃-Bi₂O₃·3TiO₂, nonlinear props. 3=15620
 SrTiO₃, dielec. const. at low temps 3=4946
 SrTiO₃, phase transition 3=5055
 Ta-anodic oxide film-metal counter-electrode 3=17930
 ThO₂-CaO solid solution, relaxation 3=20700

Dielectric properties of substances — contd**solids — contd**

TiO₂, effect of covalent binding on permittivity 3=17931
 TiO₂, frequency and temp. depend of dielec. const. 3=25398
 TiO₂, microwave props. 3=13112
 TiO₂:Nb₂O₅, anomalous polarization 3=22999
 WO bronzes 3=25390
 Yb₂O₃ thin films 3=8555
 ZnO, photodielectric effect, 3rd type 3=23023
 ZnS: Cu, Cl, changes induced by photoconduct. effect 3=911
 ZnS electroluminescent cells 3=2947
 ZnS, meas. and model 3=8556
 ZnS, meas. at 7.25 Mc/s 3=17932
 ZnS phosphors, photodielec. effect 3=13105
 ZnS thin films 3=8555
 ZnS:Cu, electroluminescent, photodielec. effect
 ZnSe, meas. and model 3=8556
 ZnTe, meas. and model 3=8556
solids, ferroelectric
 See Ferroelectric materials.
Differential analysers
 See Calculating apparatus, differential analysers.
Differential equations
 Cauchy problem for Laplace eqn., axially symmetric system 3=18694
 $\nabla^2 \Psi - \Psi + \Psi^3 = 0$, approx. solns. 3=12393
 Dirac radial relativistic eqn. for particle in central field 3=21237
 electric field, ionized, regular solutions and boundary conditions 3=19168
 elliptic type, Green's function method 3=1578
 generalized "cross-correl." field quantities 3=21203
 heat conduction with time-depend. heat sources 3=1852
 Laplace, numerical soln. 3=21193
 linear, Lie algebraic soln. 3=11664
 for molecular potential-energy function 3=17550
 non-linear partial, analysis, arising in hydrodynamic stability 3=18779
 non-linear, small perturbation solution, appl. 3=5397
 relativistic, group props., Racah approach 3=3725
 Riccati, upper and lower bounds 3=11662
 shock wave formation and discontinuity propagation 3=21483-4
 for stream-lines, axially symmetric problems, analogue transform. soln. 3=11661
 Thomas-Fermi, ion, negative, existence and solution uniqueness conditions 3=23783
 wave eqn., approx. soln. 3=21195
 Whittaker functions, tables of 3=13995
 van der Pol, trajectories 3=18689
 vibration theory, Lagrangian integration, criticism 3=18697
Diffraction
 arbitrary incident waves 3=21209
 circular aperture, nonunif. nonsymm. illumin. 3=5528
 Fresnel, at plane phase grating 3=5529
 image, focusing, correl. 3=16495
 planewaves by apertures in plane screen 3=17
 by polygon, 2-dimensional 3=1581
 prolate spheroid with eccent. almost one 3=4274
 review 3=1834
 rigid slit, plane waves 3=1750
 shock waves, weak, round arb. shapes 3=23972
 Sommerfeld-Runge law in 3 and 4 dimensions 3=21
 teaching demonstration, Fresnel, using 3 cm e.m. waves 3=18687
 3-dim. reduction, Dirichlet problem to Laplaces' eqn 3=18
 by transparent wedge 3=14001
acoustic waves
 h.f., formulae for general media 3=9931
 on moving plate, non-stationary pressure wave 3=1774
 by polygon, 2-dimensional 3=1581
 spherical cap, of axisymm. wave 3=3856
 3-dim reduction, Dirichlet problem to Laplace's eqn. 3=18
acoustic waves, ultrasonic
 acetone, angular width 3=21356
 flaws, artificial, Al in water 3=14274

Diffraction — contd

acoustic waves, ultrasonic — contd

- steel, 8-45 Mc/s, rel. to isotropy of props. 3=12918
- KCl, 8-45 Mc/s, rel. to isotropy of props. 3=12918
- NaCl, 8-45 Mc/s, rel. to isotropy of props. 3=12918

electromagnetic waves

- atmospheric layers, inhomogeneous 3=19457
- boundary value calc., quasi-static series, improvement 3=24461
- in broad waveguide, by large object 3=496
- by circular plate and hole 3=493
- conducting plate in conducting half-space 3=2125
- by cone, hollow, homogeneous, isotropic, far-field patterns 3=12311
- by grating with triangular section rulings 3=24472
- conducting cylinder clad by anisotropic plasma sheath 3=19446
- convex body, short-wave asymptote 3=495
- cosmic radio sources, by moon 3=3613
- curved surfaces with periodic impedance props. 3=7700-1
- cylinder, long, loop excitation of travelling waves 3=4272
- cylindrical, by cylinder, parabolic, conducting, for vert. polarization 3=9932
- cylindrical wave, by parabolic cylinder 3=4271
- by dielectric ribbon or elliptical cylinder 3=7699
- by disk, circular, conducting 3=12312
- by grating with polygonal profile 3=17051
- h.f., formulae for general media 3=9931
- by ionospheric thin phase-changing layer 3=11427
- Kirchhoff-Young theory 3=19445
- from lattice of metal ribbons, normal incidence 3=2124
- metal cylinder covered with absorbing layers 3=4273
- by mineral inclusions, radiosopic detection theory 3=18489
- plane waves, by right-angled wedge 3=5847
- by polygon, 2-dimensional 3=1581
- pulse by half-plane, Fourier method 3=24470
- radiation transfer eqn. for aspherical scatt. 3=7696
- Saxon-Schiff theory, for weak scatterers 3=5846
- slit, plane wave, complete closed soln. 3=494
- terrestrial waves, zonal harmonics theory 3=5855
- 3-dim reduction, Dirichlet problem to Laplace's eqn. 3=18
- by wedge 3=5845
- wedge, finite conductivity 3=14771

electrons

See Electron diffraction.

light

- Airy formulae, energy complex amplitudes 3=19006
- apodization problems posed by Luneberg 3=9619
- CrBr₃, study of ferromag. domain structure 3=11072
- crossed cylinders, spherical aberr. diff. 3=3868
- crystals, anharmonic, by distorted u.s. wave 3=25442
- digital computer calc. of intermediate Fourier images of grating 3=24053
- figure sinX/X, iterative, by infinite reseau 3=266
- Fraunhofer and Fresnel, photographic demonstr. 3=257
- Fraunhofer, photoelec. polarization meas. 3=270
- Fresnel, at edge of transparent half-plane 3=24054
- Fresnel transformation, image meas. 3=16742
- frequency response techniques appl. 3=16743
- high-frequency, by sound (100 Mc/s) in water, angular width rel. to sound wavelength 3=11938
- high numerical aperture, obeying sine condition, transfer functions 3=5512
- images, in low-resolution microscopy, meas. 3=9617
- images of circular objects, high-resolution microscopy 3=9618
- instrumental, theoretical represent. 3=265
- integrated intensities, photographic meas. 3=9615
- magnification beyond Rayleigh's limit 3=14316
- maser interferometer studies 3=9614
- maser, Nd in glass rod, far-field Fabry-Perot rings 3=24512
- measurement using photon-counting techniques 3=3702
- modulators, with u.s. wave sources, xylol and CCl₄-filled frequency characteristics 3=1833
- orthogonal wave, by u.s. plane progressive wave 3=24056

Diffraction — contd

light — contd

- by perfect system and one with $\frac{1}{4}\lambda$ spherical aberration 3=264
- phase contrast microscopy, vector theory 3=19018
- phase objects, with partially coherent light 3=14317
- by polygon, 2-dimensional 3=1581
- by prism, 3-dimensional problem 3=19017
- rainbow, primary, caustic locus 3=9577
- resonance diffraction, in lamellar system 3=3891
- Ronchi test, theory 3=24052
- single line objects, stray light effects 3=9620
- slit, plane, p-waves, boundary conditions 3=267
- Sommerfeld cylindrical wave, for one-dim. objects 3=7354
- 3-dim. reduction. Dirichlet problem to Laplace's eqn 3=18
- by ultrasonic waves, damped 3=19019
- by u.s. beams, wide, high-frequency, investigation 3=24057
- u.s. diffraction shutters for laser oscillators 3=24016
- by u.s. waves, effect of transducer alignment 3=19020
- by ultrasonic waves, phase and amplitude modulation. 3=220
- by u.s. wave, visualization of wave 3=14366
- by u.s. waves in Fresnel region 3=9616
- water, by u.s. waves, frequency shifts 3=7210
- wavefront reconstruction technique 3=11895

neutrons

See Neutron diffraction.

X-rays

See X-ray diffraction.

Diffraction gratings

- Au and Pt, efficiencies, in vacuum u.v. 3=16800
- concave at grazing incidence, ray tracing to find image 3=24055
- concave, two at grazing incidence, useful width 3=21565
- use for contrast transmission function meas. 3=268
- Ebert, astigmatism removal using paraboloid mirrors 3=16799
- echelle at State Optical Institute, U.S.S.R. 3=24051
- echellette, ideal, intensity distrib. 3=7355
- as filters, broad-band, low-pass, i.r. 3=19021
- groove angles of 110° and 120°, giving higher blaze efficiencies due to polarization avoidance 3=19022
- intensity variations, rel. to Wood's anomaly 3=1832
- movement, slow motion devices 3=14365
- plane phase grating, Fresnel diffr. 3=5529
- reflecting, in interference systems, for linear shift meas. 3=19015
- reflection and transmission factors calc. 3=258
- Ronchi test, theory 3=24052
- skew ray tracing through concave gratings 3=3890
- spectrometers, astronomical, concave gratings 3=9147
- u.s. waves as periodic moving grating 3=9616
- u.v., vacuum, review of theory and appl. 3=7338
- vacuum u.v., specially coated, efficiency 3=7329
- wavelength meas., concave grating spectrograph 3=18984
- X-rays, ultrasoft, performance 3=14705

Diffusion

- See also Neutrons and antineutrons, diffusion; for diffusion of matter, see Diffusion in gases; Diffusion in liquids; Diffusion in solids.
- adsorbant medium, kinetics and thermodynamics 3=9376
- atmosphere, planets, gravit. effects 3=16347
- biological processes 3=3642
- Boltzmann solution of one-dimensional equation 3=18759
- CO₂ pulmonary, rel. to human cardiac output 3=3637
- closed systems, characterized by time constant 3=1640
- current-layer diffusion in one-dimensional pinch 3=1989
- discharges, elec., electrode material entry 3=1945
- elec. discharge, positive column, anomalous 3=12095
- electrons, back diffusion in N₂, H₂, Ar 3=5693
- electrons in ion source 3=5716
- electrons, in scattering gas 3=5820
- equation, Boltzman Matano solution, uniqueness 3=11733
- equation, many-region, time-dependent, simplification 3=5546
- equilibrium-rate theory validity 3=23806
- flow over wedges, mass transfer at surface 3=5409
- fluid under shear flow, source functions 3=3797

Diffusion — contd

- fluids, free energy dissipation 3=9377
- growth of spherical particle, diffusion-controlled 3=11297
- interdiffusion of 2 subs. rel. to quasi-periodic precipitation 3=8957
- laminar flow, mass transfer from wall 3=7176
- macromolecules, rotatory diffusion consts. of stiff chains 3=10554
- Markov, trajectory stability 3=18736
- mechanical basis 3=1639
- membrane, with mixed boundary conditions 3=5418
- metals, f. c. c., impurities, saddle-point config. 3=2789
- molecules, spherical, rotational 3=15329
- percolation, band and site problems, two dimensional 3=11734
- periodic potential, Brownian particle 3=23806
- plasma, charged particles, in mag. field 3=21790
- plasma, fully ionized, particle propag. 3=7510
- plasma, in mag. field, like-particle collisions 3=24286
- potential barrier penetration in variable external fld 3=83
- self-diffusion, n.m.r. spin-echo meas. 3=24499
- spherical geometry, statistics 3=14166
- suspensions, thermodynamic theory 3=8984
- water, in Na carboxymethyl cellulose gel 3=1403
- Zn, in Cu, saddle-point config. model 3=2789

acoustic waves

See also Scattering, acoustic waves.

No entries this year

electromagnetic waves

See also Scattering, electromagnetic waves.

- ethyl alcohol, at mm wavelengths 3=1706
- in medium filling half of three-dimensional space 3=5848
- methyl alcohol, at mm wavelengths 3=1706
- stellar atmospheres and nebulae 3=9240

light

See also Reflectivity; Scattering, light.

- coefficients, high-speed calc. from Rayleigh interference fringes 3=7356
- photographic emulsions, non-negative signals 3=3892
- plates and lenses, flare meas. method 3=16801
- resonance radiation, Bouguer's law 3=9597
- stellar atmospheres and nebulae, resonance radiation 3=16403
- by surface with irregularities comparable with wavelength 3=9622
- Co²⁺ ions in organic solvents 3=10923
- KCl:Co²⁺ and :Ni²⁺, meas. 3=10923
- MgO surface, for reflectance standard 0.3-2.6 μ 3=1786
- NaCl:Co²⁺ and :Ni²⁺, meas. 3=10923
- Ni²⁺ ions in organic solvents 3=10923

Diffusion in gases

See also Flow, gases.

- ambipolar inertia-controlled diffusion 3=5462
- ammonia and diethyl ether, interdiffusion 3=9492
- atmosphere, turbulent, generalized theory 3=9026
- atmospheric, wind tunnel modelling 3=18500
- binary systems, determination from viscosity 3=7231
- binary, trace lighter component, formulae 3=16651
- from corresponding states and intermolecular potential 3=16650
- density effects, symmetries stationary isothermal diffusion 3=21426
- diffusiophoresis in atmosphere 3=11417
- discharge, electrodeless, free to ambipolar transition 3=5636
- dissociating gas, perturbation by catalytic probes 3=18430
- electron drift velocity in hydrogen, nitrogen 3=9729
- electrons, drift vel./diffusion coeff. 3=12251
- electrons in Van Allen belt 3=9112-13
- electrons, momentum transfer cross-section 3=14199
- evaporation, conditions 3=16649
- hydrogen, 20.35°K, assuming nine ortho spin states are distinguishable 3=8312
- from instantaneous source in gravity field 3=21427
- interdiffusion in graphite 3=16652
- ionized gas mixtures, separation effects 3=5626
- ionized gases, charged particle coeff. meas., by diffusion wave method 3=16906
- kinetic theory, Maxwell-Chapman method 3=3825

Diffusion in gases — contd

- Lamm's theory coeffs., reln. to viscosity 3=21326
 - meas., rapid, chromatographic techniques 3=11821
 - mixture, rel. to viscous transfer of momentum 3=5463
 - molecular flow in isothermal enclosure 3=14201
 - particulate matter in atmosphere 3=9023
 - plasma, ambipolar diffusion in weak mag. field 3=7603
 - plasma, anomalous, with current in magnetic field 3=14573
 - plasma, anomalous diffusion, from micro-instabilities 3=5652
 - plasma, charge carriers, approx. calc. 3=21761
 - plasma, decay in mag. field 3=14591-2
 - plasma, in magnetic field, effect of "drift" waves 3=24322
 - plasma in mag. fld. 3=7522
 - plasma, in magnetic field, theory 3=403
 - plasma from stellarator 3=12195
 - plasma, theory, stochastic methods 3=12124
 - plasma, weakly ionized, ambipolar diffusion 3=24282
 - positive column, in longitudinal magnetic field, 3=14554
 - self-diffusion coeff., density expansion calc. 3=3829
 - Ar, r.f. with mag. fld., enhanced 3=1944
 - CO₂, self-diffusion, rel. to temp. 3=20033
 - CO-CO and CO-N₂ systems 3=7232
 - H₂, electron diffusion 3=6391
 - He³, self-diffusion, 1.7-4.2°K. 3=178
 - H₂O, in air, teaching meas. 3=21425
 - Kr⁸⁵, in dense ethylene gas, meas. 3=1720
 - Kr⁸⁵, in dense Ar gas, meas. 3=1720
 - Kr⁸⁵, in dense CO₂ gas, meas. 3=1720
 - Kr⁸⁵, in dense He gas, meas. 3=1720
 - Kr⁸⁵, in dense Kr gas, meas. 3=1720
 - Kr⁸⁵, in dense N₂ gas, meas. 3=1720
 - Kr⁸⁵, in Ne-Kr and Ar-Kr, meas. 3=3822
 - N₂, electron diffusion 3=6391
 - N₂, A³ Σ_u^+ state, excited by microwave discharge 3=17579
 - ZnS-HCl system, vapour transport of solid 3=8945
- thermal**
- analysis 3=9493
 - binary gas mixtures, temp., pres. depend. 3=21428
 - binary mixture, rough spheres of equal mass, diameter 3=11818
 - binary mixtures, Chapman-Cowling scheme, simpler formula 3=7235
 - binary mixtures, effect on convection 3=19047
 - binary mixtures, rigorous and approx. theory 3=7233
 - binary mixtures, simpler formulae 3=3821
 - binary mixtures, simplified Kihara-Mason approx. 3=18843
 - fluidized bed, meas., by instantaneous point heat source 3=14111
 - hot-wire columns, performance eval. 3=21432
 - pressure dependence, existence 3=21429
 - self-diffusion, theory and meas. methods 3=11817
 - separation, nonrigorous eqns. deriv. 3=23872
 - ternary mixtures, theory 3=14202
 - thermal diffusion column, shape factors 3=165
 - thermal-diffusion column, theory, performance 3=166
 - through porous materials, slip flow, separation of two gases 3=9491
 - water vapour, non-isothermal and Onsager's relation 3=11820
 - Ar⁴⁰-Ar³⁶ in pure Ar, meas. 3=14203
 - CO₂, self-diffusion 3=11817
 - C¹⁴O-C¹²O in pure CO, meas. 3=14203
 - D₂ with trace of HT, model 3=11818
 - H₂-D₂ mixtures, low temp. 3=21428
 - H₂-N₂, effect on convection 3=19047
 - He⁴ mixtures with HT, DT, T₂, meas. 3=21430
 - He, transpiration, 10⁻⁸-20 torr 3=18844
 - He-H₂, quantum mech. diff. effects 3=21431
 - He⁴-He³ in pure He, meas. 3=14203
 - He³/He⁴, meas. down to 136°K 3=11823
 - He-Xe, calc. 3=7233
 - Ne²²-Ne²⁰ in pure Ne, meas. 3=14203
 - Ne²⁰/Ne²², meas. down to 136°K 3=11823
 - Kr, self-diffusion 3=11817
 - Kr, trennschaukel meas. 3=11822
 - Xe, trennschaukel meas. 3=11822

Diffusion in liquids

- See also Flow, liquids.
 anomalous polymer-penetrant permeation 3=1679
 benzene, and n.m.r., p, in paramag. C 3=21406
 butanol in water, trajectories, finite cell 3=18806
 chemical extraction, from capillary channels 3=6906
 colloidal electrolytes, rel. to molec. wt. detm. 3=6938-41
 diaphragm cell data, effect of mixing volume changes 3=21328
 effect on Taylor instability in solutions 3=11789
 electrolytes, isothermal 3=5167
 electrolytes, restricted diffusion, interference optics study 3=5434
 electrolytic polishing, Cu in H_2PO_4 3=11351
 immiscible liquids interface, bubble-stirred 3=21325
 impurities in semicond. melt 3=18804-5
 impurities in Si melt 3=18803
 ions in membranes, generalized eqns. 3=16607
 ions in polyelectrolyte solns., theory 3=9447
 Lamm's theory coeffs., reln. to viscosity 3=21326
 macromolecular chains, in solvents, meas. 3=9454
 meas., by electrolysis 3=5431
 meas., rapid, chromatographic techniques 3=11821
 metal ammonia solutions 3=21414
 metals, by isotope transfer 3=21330
 methane, self-diffusion 3=7202
 monolayer spread properties, solvent effect 3=11365
 n-paraffins in dil. solution 3=16606
 organic liquid pairs, and coordination numbers, temp. depend. 3=21329
 rotational, rel. to light scatt. by mols. 3=7209
 solid particles, reacting with liquid 3=7199
 solution processes, diffusion controlled, moving boundary effects 3=5436
 solutions, multicomponent, isothermal 3=11785
 solutions, rel. to light scatt. and u.s. absorption 3=21368
 solutions, 3-ion diffusion 3=21327
 ternary systems, density gradient, gravitl. stability 3=1681
 thermal, inertial effects, theory 3=16608
 time-dependent pair distrib. function, linear veloc.-gradient 3=14150
 trajectories, butanol in water, finite cell 3=18806
 unsteady convective, one-dimensional problem 3=11786
 water-glycine-KCl 3=1681
 Bi, Ag diffusion, 300-700°C 3=21331
 CF_4 , effect on n.m.r. 3=21412
 CF_4 -Ar, effect on n.m.r. 3=21412
 CH_4 , effect on n.m.r. 3=21412
 CH_4 -Ar, effect on n.m.r. 3=21412
 GeO_2 , of O^{18} 3=20224
 He II-He³ mixtures, theory 3=1881
 He³, in liq. He II, theory 3=19088
 He³, self-diffusion, 0.35°-3°K meas. 3=19085
 He³-He⁴, λ -pt to 0.6°K 3=3939
 H_2SO_4 , aq. soln., meas. at 25°C 3=9448
 K, molten, self-diffusion 3=16610-11
 Na_2SO_4 - H_2SO_4 - H_2O system, isothermal 3=1680
 Nb, in cast Fe, by electrolysis 3=5431
 Si, in cast Fe, by electrolysis 3=5431
 Sn, self-diffusion in Sn plus Zn mixture 3=5432
 TcO_4^- , by conductivity, N/10 solns. 25°C 3=16609
 Tl amalgams, interdiffusion meas. 3=21332
 Tl, in cast Fe, by electrolysis 3=5431
 Tl ion in fused $TiCl_3$, temp. depend. 3=5433
 Va, in cast Fe, by electrolysis 3=5431
 Xe¹²⁹, in solid and liq. Xe, meas. 3=18154
 Zn, self-diffusion in Sn plus Zn mixture 3=5432

thermal

- binary mixtures, effect on convection 3=19047
 carbon tetrachloride-cyclohexane 3=7201
 separation, nonrigorous eqns. deriv. 3=23872
 thermogravitational, expt. factors 3=7201
 thermogravitational, formal theory 3=7200
 $LiNO_3$, molten, by Li isotope 3=131

Diffusion in solids

- See also Permeability, mechanical.
 alkali metal halides, of inert gases prod. by n irradi. 3=15508
 alloys, acceleration by excess vacancies, rel. to neutron irradi. 3=10702

Diffusion in solids — contd

- alloys, under elec. field, new meas. technique using tracers 3=20235
 anisotropic, correlation calcs. 3=4885
 austenite, N diffusion, effect on internal friction 3=20695
 autoradiography method 3=17784
 chabazites, self and exchange-diffusion of ions 3=6534
 crystals, thermal diffusion, semiempirical approach 3=4884
 and deformation, high temp., crystals, review 3=23329
 during plastic deformation, enhanced, mechanisms 3=8449
 earth interior, ionic substitution 3=18479
 electron microprobe application 3=3377
 equation, one-dimensional, solutions, with concentration-dependent coeff. 3=22800
 ferromagnetics, activation energy 3=4883
 Fick's first eqn., verification 3=15503
 gas, interdiffusion in graphite 3=16652
 gaseous diffusion in porous media 3=14200
 gases in glass, silicate, fused, rel. to structure 3=1362
 grain-boundary problem, various solutions 3=15504
 grain boundary, theory 3=2820
 graphite, B diffusion 3=13000
 graphite, self-diffusion, rel. to heat treatment 3=17741
 heavy impurities, theory for 1-dimensional lattice 3=22804
 ice crystals, protons and tritons 3=22816
 impurity diffusion in f.c.c. lattice, correlation factors 3=6531
 ionic, self-rel. to exchange-diffusion 3=10685
 metals, effect of defects prod. by plastic deformation 3=15505
 metal layered structures, X-ray diffr. 3=23437
 metals, f.c.c., impurities rel. to multicentre defect config. 3=22700
 metals, in Ti and Ti-Nb alloys 3=20233
 metals, interdiffusion, X-ray diffr. method 3=2822
 metals, noble, pressure effects 3=22740
 metals, plastically deformed, rise of diffusion coeff. 3=25296
 metals, radiation-induced 3=8457
 metals, review 3=12997
 metals, review 3=15507
 metals, self, crystal vacancy and interstitials, calc. 3=22801
 metals, strain-enhanced, dislocation and grain-boundary short-circuiting models 3=22802
 metals, surface, anisotropy meas. 3=15506
 moisture, new meas. method 3=8448
 oxide cathodes, activation process 3=9831
 point defects study in metals, solid solns. 3=8456
 polycrystals, coarse-grained, theory 3=4882
 polycrystals, effect of boundary diffusion on creep 3=15997
 polycrystals, lattice and grain boundary diffusion 3=8448
 polycrystals, under stress, diffusion-viscous flow, along grain boundaries 3=25288
 polycrystals, with branched network of interfaces 3=6530
 polyethylene terephthalate, diffusion of gases 3=11306
 polymer films, gas diffusion, linear free-energy relationship 3=2821
 porous media, effective diffusion coeff. 3=23496
 quartz, substitution of Ag^+ for Li^+ ions, pot. and ionic change 3=17788
 α -quartz, Ag ion transport 3=10692
 rare earths, in Ag and Pb, anomalous 3=13005
 recoil atoms in ionic solids 3=8475
 self, activation energy relation to thermal properties 3=20218
 self-diffusion coeff., meas. by β -rays 3=20215
 self-diffusion, orientated, with temperature gradient 3=2819
 semiconductors, interstitial-substitutional equil. 3=20225
 semiconductors, ion drift in electric fields 3=13052
 solid solutions, impurities, thermodynamic theory 3=22803
 steel, austenite boundary migration rates 3=23482
 structure-sensitive mechanism 3=20233
 superconducting backing into films 3=22805
 surface diffusion from point source 3=10684
 surface, review 3=17780

Diffusion in solids — contd

- thermal (Soret) coeff. expression 3=20217
 through dislocations, activation energy 3=2827
 volatile impurity, meas., radioactive 3=20216
 water in surface oxides on Ge 3=20138
 water vapour, in porous materials 3=11819
 zone melting, impurity motion, infinite ingot 3=20802
 Ag, diffusion of Ni and Co 3=22814
 Ag halides, ionic transport processes 3=13007
 Ag, self-diffusivity in twist boundaries 3=22820
 Ag, self, surface 3=22821
 Ag, surface diffusion coeffs. meas. 3=17792
 Ag, surface self-diffusion and faceting 3=25292
 Ag in quartz, with amorphous—cryst. transition 3=13396
 Ag, of Ag, surface 3=20232
 Ag in Al—Ag alloy, rel. to precipitation 3=18356
 Ag—Au solid solutions, self-diffusion meas. 3=6538
 Ag, in Bi₂Te₃, meas. 3=12998
 Ag, in Cu bicrystals, grain boundary slide 3=6533
 Ag¹¹⁰ in GaAs, 600° to 1000°C 3=13002
 AgBr, mobile Ag ions rel. to latent-image formation 3=11948
 Ag—Ni alloys, Fick's first eqn. 3=15503
 Ag—Zn alloys, of Ag, Zn, under elec. field 3=20235
 d in Al, by d + d → He³ + n 3=17352
 Al, Sb diffusion, under elec. field 3=22830
 As in Ge, solid solubility det. 3=3342
 As, in Si, 1100°–1350°C meas. 3=10689
 Au, vacancies and divacancies 3=4863
 Au, of Ag, surface 3=20232
 Au in BiTe₃ 3=17781
 Au, in Cu, grain boundary diffusion 3=2824
 in Au—Pb evap. films, vacancy mechanism 3=20226
 Au¹⁹⁹ in Zn, anisotropic 3=17793
 B, in Si, through oxide layer 3=10690
 B, in Si, through SiO₂ layer, anomalous 3=17789
 B into Si, through Si oxide layer 3=8453
 BeO, irradiated, He diffusion after annealing, from specific heat below 4°K 3=15509
 Bi in Ge, solid solubility det. 3=3342
 Bi₂Se₃, doping activation energy 3=8516
 Bi₂Te₃—Bi₂Se₃, of Ag, and escape, effect of atmosphere 3=20219
 C in Fe, mobility, rel. to pressure 3=20234
 C in Fe, Co, Ni, Ti, Ta, W, by electric fields 3=20236
 CO₂ in "Aerosil" silica 3=18399
 Cd in InSb 3=17784
 Cd^{115m} in Zn, anisotropic 3=17793
 CdGeAs₂ 3=8518
 CdS, In diffusion in electric fields 3=13052
 CdSnAs₂ 3=8518
 Ce, in Fe, distrib. on crystallization 3=20229
 Co, in CoTe polycrystals 3=20221
 Co, of W, by electric current, 1100–1350°C 3=17782
 Co—Ni alloys, of Co and Ni, mag. effects, near Curie temp. 3=15514
 Cr in Ni—Cr—Fe, 1294°C 3=20231
 Cu, by impurity thermionic emission 3=4203
 Cu, in Au crystals in boiling HCl 3=4888
 Cu, in InSb, interstitial, mechanisms 3=17783
 Cu, H₂ diffusion 3=20220
 Cu—Ni, alloy system, rel. to composition 3=6532
 Cu—Zn alloy, f.c.c., torsional deform. 3=12999
 CuO, Cu₂O, of O₂, in CuO film growth in O₂ 3=23516
 Cu₂O, O diffusion 3=22735
 Cu, Ti diffusion, 785°–996°C 3=22826
 F¹⁹, in CaF₂: Sm³⁺, n.m.r. narrowing 3=23271
 Fe, meteoritic, thermal diffusivity 3=11526
 Fe, self, bulk and intercryst., effect of Ti, up to 1% wt. 3=22812
 α-Fe, diff. of Au, Co, Ni, effect of ferromagnetism 3=22810
 δ-Fe, diff. of Co⁶⁰ and Fe⁵⁹ 3=22811
 Fe films, from conductivity, electrical and activation energy 3=15538
 Fe, self-diffusion in α, γ and δ phases 3=25290
 Fe, self, no effect due to Ce 3=22813
 Fe, surface self-diffusion after vac. anneal. 3=13003
 Fe, Co and Ni, in Au, meas. 3=8449
 Fe, Co, Ni in Ag, rel. to solubilities 3=13006
 Fe, Cr in βU 3=10691

Diffusion in solids — contd

- Fe in Ni—Cr basis polycrystalline alloy 3=20231
 Fe, in Si, 30°–85°C 3=13066
 Fe^{55,59} in Ti and Ti—Nb alloys 3=20233
 Fe⁵⁹ in α-Fe₂O₃ 3=22807
 GaAs, Zn and Cd diffusion, rel. to surface masking 3=25289
 GaP, Zn diffusion and solubility 3=10686
 in Ge, impurity diffusion, mechanism 3=20222
 Ge, profile in etching, meas., from corrosion pot., n-type 3=20228
 Ge, rel. to annealing 3=22750
 Ge—Si system, heterodiffusion, electron-diffraction study 3=22808
 Ge tunnel-diode junctions, impurity drift 3=20362
 GeO₂, of O¹⁸ 3=20224
 H in quartz 3=8452
 H and vacancies, in Cu 3=15481
 H₂ in Pd, mass spectrometry 3=2829
 H₂, in rolling surfaces with water-accelerated fatigue 3=25644
 αHe³, self-diffusion, rel. to lattice defects 3=8422
 He³, solid, self-diffusion meas. 3=5574
 HgTe—CdTe 3=17786
 In, in Mg, film, superimposed and film superconductivity 3=22805
 In, in p-type CdTe, meas. 3=22806
 K crystals, K atom surface diff. 3=25291
 KCl—KBr, mixed crystal formation 3=13004
 La—H system, proton self-diffusion 3=20671
 Li in GaAs, rel. to acceptors 3=17877
 Li⁷ through W, 1500°K 3=8455
 LiBr, spin-lattice relaxation due to translational diffusion 3=18143
 LiF, Na diffusion 3=22817
 LiF, pipe diffusion of Na 3=10687
 Mg of Ag¹¹⁰, ion mobility, d.c., and scatt. 3=22831
 Mg, film, of In backing, and film superconductivity 3=22805
 Mg—1/2 wt. % Zr alloy, rel. to grain-boundary denuded zones 3=16116
 Mn, in NaCl+MnCl₂ and NaCl crystals 3=6535
 Mo in α- and γ-iron 3=22818
 Mo, self-diffusion in single and polycryst. 3=17787
 N, in Cr, activation energy 3=6865
 Na in NaCl by vacancy jump 3=23273
 Na⁺, in glass, after addition of Na₂O, 400–500°C 3=22936
 NaCl in LiF, pipe diffusion 3=2827
 NaCl, Cu diffusion, effect of dislocations 3=15513
 Nb in Ti—Nb alloys 3=20233
 Ni, of Ag, surface 3=20232
 Ni, films, from conductivity electrical and activation energy 3=15538
 Ni, H diffusion, purity 3=22819
 Ni⁶³, in NiO, meas. and mechanism 3=2828
 Ni, in NiS layer, in reaction with S vapour 3=1387
 Ni, in NiS polycrystals 3=20221
 Ni⁶³ in PbS 3=17785
 Ni in Si 3=6537
 48% Ni—Fe, cubic face-centred, H, mag. props., -130°C 3=15853
 NiS, self diffusion of S³³, 820–885°C, Ni⁶³, 750–880°C 3=8451
 O₂ in Si 3=15579
 O¹⁸, in ice, and defect, new type 3=6512
 O in Fe, rel. to internal friction peak, 250°C 3=8756
 O₂ in Nb₂O₅, rel. to elec. props. above 600°C 3=2923
 O, self-diffusion in PbO, oxidation process 3=20230
 O, in Si, during thermal oxidation 3=13600
 O, in TiO₂, quartz and quartz glass 3=2831
 P in GaAs 3=20227
 P, in Si, distribution 3=2833
 P, in Si, fast mechanism 3=2832
 P, meas. by n.m.r. relaxation times 3=5050
 Pb, in Au crystals in boiling HCl 3=4888
 Pb²⁺ in KCl 3=15510
 Pb²¹⁰ in PbS, effect of stoichiometry and doping 3=10688
 Pd, Pd-25% Ag, H diffusion, purity 3=22819
 Pt, by impurity thermionic emission 3=4203
 S³⁶ in Fe, 880° to 1450°C 3=8450
 Sb on Ge surface, 250–650°C 3=20223
 Sb¹²⁴, in Ni, temp. depend. 3=15511

Diffusion in solids — contd

- Se, in GaAs, radioactive and elec. meas. 3=22809
- Se, of Th, optical obs. 3=15512
- Se and Tl in Tl_2Se and $InSe$, rel. to rectification 3=25293
- Si, impurities 3=22824
- Si, p-type, Cs diffusion 3=25349
- Si, rel. to proton-irrad. 3=22825
- Si tunnel diodes, P diffusion-doping 3=20361
- Si, of B, distrib. 3=22822
- Si-Fe, containing C, diffusion after-effects 3=13254
- SiO_2 , of O_2 , in SiO_2 film growth in O_2 at 1250°C 3=23516
- SiO_2 , Sb diffusion 3=25294
- Si, P and B diffusion in, ion bombardment effects 3=22823
- Si, Zn diffusion in elec. fields 3=17790
- Sn, in Au crystals in boiling HCl 3=4888
- Sn, in GaAs, radioactive and elec. meas. 3=22809
- Sn, in Ni surface 3=6539
- Sn, polycryst., grain boundary self-diffusion 3=2830
- Sn-Tl, grain boundary segreg. of Tl 3=16118
- Te, in CoTe polycrystals 3=20221
- Te, in Ge 3=2825
- Ti-Cr system, b.c.c., Kirkendall effect 3=4887
- Ti, self, thermal, high temps. 3=22828
- Tl, in Te, temp. depend. meas. 3=17791
- Tl ions, in Ge, effect of elec. field 3=25345
- Tl^+ ions, in KBr, meas. 3=6536
- U, its alloys and cpds., review 3=8454
- UO_2 , inert gas release, abnormal kinetics 3=22441
- W in α - and γ -iron 3=22818
- W in W, TaC, TiC-WC, TiC-WC-TaC 3=25295
- W(15 at.%)—Mo, of W and Mo, electric field, effects 3=20237
- W surface, ordered, thermal rearrangement 3=18376
- Xe^{133} fission product, in graphite 3=10427
- Xe^{129} , in solid and liq. Xe, meas. 3=18154
- Xe, in UC powder 3=2834
- Y_2O_3 , Y diffusion, 1400-1800°C 3=22827
- Zn^{65} , in Cu, rate for small penetration 3=13001
- Zn, in GaAs, interstitial—substitutional 3=20225
- $ZnGeAs_2$ 3=8518
- ZnS; Cu diff. rel. to electroluminescence 3=15723
- Zr, self, thermal, high temps. 3=22828

Dimensions

See also Units.

- analysis, generalized, index value restriction conditions 3=16487
- assignment, philosophical aspects, mechanical and electrical 3=13985
- fine structure constant, lack of 3=16486

Discharge tubes

See Electron tubes; Gas-discharge tubes; Ion sources; Particle accelerators; X-ray tubes.

Discharges, electric

See also Arcs, electric; Breakdown, electric; Corona, electric discharge; Plasma; Sparks, electric.

- a.c., electric oscill. generation mech. 3=9740
- in acetonitrile, spectrographic study 3=12846
- aerials, corona breakdown 3=5854
- afterglows, ion—neutral collisions meas. 3=5642
- air, electron temperature, excited by external sleeve electrodes 3=12084
- air, low-freq. silent, rectification 3=370
- air, shock waves, magnetically driven 3=7278
- in air, 35.6 Mc/s discharge 3=16919
- air, Townsend, photon absorption 3=4029
- anode space, electrode evap. effects 3=19198
- anode space formation 3=19197
- auxiliary, in thermionic converter, characteristics 3=7422
- avalanche transition to visible discharge 3=21711
- Canal ray, mechanism 3=21729
- cathode-spots formation 3=21721
- chromatographic detector, gas 3=8993
- "classical" gas to plasma physics, review 3=9764
- collisionless plasma-sheath transition 3=5644
- column without self-propagating power in mag. field, theory 3=4035
- conference, ionization in gases, Munich (1961) 3=1928
- conference, Leatherhead (1962) 3=7450
- current channel formation in weak magnetic field 3=1958

Discharges, electric — contd

- configuration in toroidal apparatus 3=12089
- current developments with time, calc. 3=14538
- d.c. abnormal glow, a.c. impedance 3=14548
- d.c. glow, moving striations, microwave meas. 3=16914
- deuterium, l.p. as pulsed neutron source 3=19659
- dielectric corona motor 3=19161
- diffusion, free to ambipolar transition 3=5636
- direct-current, inert-gas—metal vapour, cataphoretic study 3=9734
- electrode damage, under pulsed discharge 3=21722
- electrode erosion by electrons, theory 3=9746
- electrode material entry into discharge cloud, role of diffusion 3=1945
- electrode material transfer, in l.v. pulsed discharge 3=21723
- electrodeless, in air, breakdown in crossed fields 3=371
- electrodeless, in transverse mag. field, breakdown 3=9743
- in electrolytes, var. with cond. and electrode separation 3=9473
- electron density, by interferometry, in Sceptre IV 3=5679
- electron density in pos. column, interferometer 3=12313
- electron-density profiles, mm-wave meas. method 3=19229
- electron emission by cathodes near zero field 3=14617
- electron and ion energy distrib. in toroidal discharges 3=14541
- electrostatic sound waves, collision damping 3=18929
- erosive characteristics, spectrosc. investig. 3=24251
- ethanol—argon mixture, Geiger, proportional regions 3=12365
- exploding wires, interaction with microwaves 3=4103
- exploding wires, review. 3=199
- Faraday dark space, anode fall 3=4028
- flash sources, continuous, spectral energy distrib. and brightness temps. 3=4047
- γ -rays, in mag. trap and azimuthal mag. field 3=7512
- gas discharge in mag. field, instability 3=14534
- gas, temporal growth of current, electronic computation 3=7460
- gaseous, electrodeless, noise and impedance meas. 3=21725
- Geiger, secondary mechanism 3=7459
- gettering, electrical, in steel vessel 3=7461
- glow, d.c., electron conc. versus time, by h. f. resonance 3=5641
- glow discharge, effect of mag. field 3=9750
- glow-discharge ionization probes for shock tubes 3=1762
- glow discharges, field emission theory 3=373
- glow, effect of hollow cathode on striations 3=7477
- glow, low-pressure, weak-current range investigations 3=24240
- glow, negative, light modulation obs. 3=7479
- glow, non-stationary, cathode fall region 3=4055
- glow, nonstationary, impedance—frequ. characteristic 3=21750
- glow, normal cathode fall, nature 3=4056
- glow, oxygen, ions, mass spectrometry 3=14552
- glow, positive column constriction 3=14549
- glow, sputtering, rel. to current 3=4213
- glow tube, impedance—pressure characteristics 3=4061
- glows, d.c., cathode fall, dynamic aspects 3=7478
- glows, dielec. permittivity meas. 3=19216
- glows, electron emission rel. to photons 3=7632
- glows in inert gases, moving striations, critical currents 3=4062
- glows, ion energies at cathode, meas. 3=16916
- glycerine, excitation temp., emission band study 3=381
- halogen counters, build-up and spread 3=4034
- helical instability of linear discharge plasma 3=12088
- high-pressure, electrode sputtering 3=14533
- high-pressure, potential minimum distance from heated cathode 3=7466
- hollow beam with low pressure, negative ions 3=1946
- hollow cathode, negative resistance, theory 3=378
- hollow cathode, sputtering 3=377
- hot cathode, high press., electron space-charge 3=9738
- hot-cathode P.I.G., in mag. field, stabilization by transverse grid 3=21735

Discharges, electric — contd

- impulse, preionization by electron beams 3=7464
- impulsive, powerful, fast electron energy meas. 3=7452
- induction, in positive ion sources, r.f. excitation 3=19189
- inert gas—H₂ mixture, motion of striations 3=19196
- inert gases, electron energy exchange, high rate 3=24268
- inert gases, low-press., moving striation mechanism 3=7458
- insulator surface, by secondary emission 3=19226
- insulators in vacuum, surface 3=16923
- intermittent, gas between two dielectrics 3=9741
- inverse-pinch type, stable plasma 3=21765
- ion energies, distrib., current intensities 3=19187
- ion oscill. at potential min. and l.f. oscill. 3=14543
- ionic sound waves, obs. 3=7457
- ionization chambers, self-maintained discharge due to α -particles 3=4038
- jet-controlled arc, as spectr. light source 3=16783
- Joshi effect, thermionic analogue 3=9737
- limiting current, effect of azimuthal mag. field 3=7487
- low-frequency excitation, Trichel light pulses 3=9742
- low-pressure, disturbance by probe 3=368
- low press., time resolved Schlieren and interferometer studies 3=9739
- low voltage 3=21724
- low-voltage, rel. to ionic spectra excitation 3=24230
- Luxembourg effect, in free space columns 3=9805
- magnetic dipole radn, stimulated emission 3=25059
- magnetic field effect on thread discharge 3=7468
- meniscus-type, l.f. noise and oscillations 3=4039
- microwave resonance in hot plasma column 3=9782
- molecular spectra meas., testing of theory 3=2620
- moving striations, dispersion and amplifc., theory 3=9752
- moving striations in tapered discharge tubes 3=24234
- nebulae, planetary, spiral and barred spiral, theory 3=18645
- neutral gas, electron transport model 3=9744
- nitrogen—organic cpds, $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ transition spectra 3=12850
- organic vapours, Townsend, effect of space charge on current growth 3=21756
- Penning discharge, electron beam probing 3=21731
- Penning, as extreme u.v. source 3=7348
- Penning, low-press., mechanism 3=7453
- Penning, radial field distrib. meas. by Stark effect 3=21730
- Penning-type, instability 3=21732
- in Penning-type tubes, space-charge effect on electron kinetics 3=21871
- PIG, electron gyrofreqn. harmonics emission 3=7465
- P.I.G., oscills., standing wave modes 3=21733
- P.I.G., oscills., standing wave, theory 3=21734
- PIG reflex, equilib. mechanism, D₁ meas. 3=9745
- pinched linear, mm-wave diagnostics 3=19230
- plane, collisionless, electrostatic stability 3=1943
- plasma, electron density, long. var., hot-cathode Hg 3=19204
- plasma gun, inductive 3=21809
- plasma "gun", mag. operated, calc. 3=9808
- plasma, hot, due to electrolytic condenser bank 3=5656
- plasma-sheath formation by r.f. fields 3=21800
- population inversion in two-gas mixture 3=7467
- positive column, anomalous diffusion 3=12095
- positive column, contraction theory 3=1951
- positive column, diffusion, in longitudinal magnetic field 3=14554
- positive column, dissociative recombination and contraction 3=4059
- positive column, electron energy distrib. 3=21746
- positive column, electron pressure effects 3=21748
- positive column, helical instability, in mag. field 3=16915
- positive column, instability in mag. fields 3=7476
- positive column, motion of striations 3=12094
- positive column, noise spectrum in mag. field 3=24285
- positive column, non-contracted, negative ion effects 3=1971
- positive column plasma, electron diffusion 3=12100
- positive column, stability in mag. field 3=21747
- positive column, striated, in longitudinal mag. fld. 3=19214
- positive column, striation waves, theory 3=19209

Discharges, electric — contd

- prebreakdown discharges in vacuum 3=9758
- pressure meas. errors in vicinity 3=12092
- probe, Langmuir, dynamic studies, review 3=1993
- probe, negative characteristic in a magnetic field 3=5634
- pulse discharges, investigation 3=24231
- pulsed electrodeless, plasma oscill. and mag. fields 3=14542
- pulsed glow, optical study of cathode-fall region 3=24239
- pulse, linear, current-onset, exptl. and theoretical investigation 3=12080
- pulsed, plasma jet, structure obs. 3=14569
- pulsed, powerful, vacuum u.v. rays 3=16931
- pulsed reflex type, afterglow instability 3=12114
- pulsed, Schlieren photography of plasma density 3=7585
- pulsed spark gas discharges, for light sources 3=14546
- pulsed, as vacuum u.v. light source 3=7349
- pulsed, wall evaporation theory 3=21720
- radially constricted, plasma transport props. 3=16926
- radiofrequency, Kihara's theory 3=12085
- rarefied gases, voltage oscillations 3=19188
- reflex, with cold cathodes, 2-beam type instability 3=24233
- reflex, d.c., electrostatic turbulence 3=4040
- ring, conical electrodeless, plasmoid generation 3=21780
- ring-discharge, electrodeless, structure study by microwaves 3=7456
- secondary electron resonance discharge 3=19203
- slow, cathode, similarity relations 3=19212
- spectra, atoms, ionized, multiple, low voltage, vacuum, atlas 3=25035
- spectrochemical analysis, Zn with Cu, effect of Si, time var. 3=25845
- spectroscopic investigations rel. to microwave and probe methods 3=4030
- spectroscopic light sources, extreme u.v., use 3=14355
- spectroscopic "slant" effect in axial mag. field, theory 3=19200
- spectroscopic sources, single-discharge 3=5522
- and stars, temperature 3=16405-6
- stratification waves, physical mechanism 3=9735
- striation wave formation, primary perturbation from influence 3=19193
- striations, moving and stationary, hydrodynamic character 3=19211
- striations, moving, propag. in 2-cathode tube 3=4044
- Surface, dielectric, critical field intensity 3=24265
- surface, on various dielec. arrangements, theory 3=1940
- switch, Hg pool cathode with gas filling 3=4082
- temperature measurement, P I G reflex pulse discharge, using a Fabry-Perot interferometer 3=24229
- thermionic energy convertor, effect of interelectrode Cs plasma 3=24206
- thread discharge, shape rel. to mag. fld. 3=19199
- thyatron, extinction using positive pulses 3=4188
- torch, temp., stabilized by air current 3=21727
- toroidal, magnetohydrodyn, stability calc. 3=1976
- toroidal pinch, mag. field, temp. variations 3=5637
- toroidal, Sceptre IV, review 3=7596
- toroidal, in varying mag. fld., helical instability 3=1960
- toroidal, wall heating, meas. 3=19202
- Townsend, analogue computer study 3=19201
- Townsend in hydrogen, distinguishing between feedback mechanisms 3=7493
- Townsend, photon absorption 3=4029
- Townsend, transient, non-uniformly lateral distrib. 3=12087
- tubular pulsed lamps, spectral charact. 3=18978
- 2 electrode gap, recovery after glow 3=19228
- water vapour, Townsend, photon absorption 3=4029
- X-ray coaxial flash tube, mechanism 3=9894
- Zeta, impurity u.v. line radiation, temporal
- A, glow, atmospheric press., Cs, K addition 3=24241
- Ar, Joshi effect, thermionic analogue 3=21736
- Ar, noise suppression by applied r.f. energy 3=12091
- Ar, positive column, pres. grad. 3=19208
- Ar, positive column in transition region 3=9752
- Ar, pulsed, light characteristics, mag. fld. effects 3=14540
- Ar, r.f. with mag. fld., enhanced diffusion 3=1944
- Ar, striation formation, time parameter characteristic interpretation 3=19194

Discharges, electric — contd

- A, transition from Townsend to glow discharge, elec. field distrib. 3=24242
- Ar, vacuum u.v. spectra 3=7462
- Ar, Z-pinch, rel. to pressure 3=9762
- B₂ pinch, particle acceleration calc. 3=4252
- CO, Townsend, photon absorption 3=4029
- CO₂, Townsend, photon absorption 3=4029
- Cs vapour, electron mobility, scatt. cross-sections 3=12186
- Cs-He, transient, nonequil. ioniz. 3=9727
- D, atomic, prod. in h.f. discharge 3=4032
- H₂ electron energy exchange, high rate 3=24268
- H, gas discharge, ignition, similarity law 3=5638
- H₂, as h.f. source of H₂⁺ ions 3=12252
- H, interaction with chamber walls 3=7451
- in H₂ + N₂, microwave line source for vacuum u.v. 3=11922
- H₂, positive burst pulse corona 3=24247
- H, r.f. with mag. fld., enhanced diffusion 3=1944
- H, Townsend, low-press., static and quasistatic characteristics 3=7454
- H₂, Townsend parameters, rel. to cathode surface layers 3=4033
- H₂, Townsend, photon absorption 3=4029
- H₂O vapour, mass spectra of ions in glow 3=7480
- He afterglow, ionization processes 3=14517
- He, afterglow, probe studies 3=7440
- He, afterglow, short visible, obs. 3=24235
- He afterglow, spectroscopic meas. 3=4105
- He afterglow, very early 3=4065
- He, e.m. radiation, 35 and 10 kMc/s, rel. to mag. field 3=4031
- He, Hall effect in positive column 3=4036
- He²⁺, as h.f. source of H₂⁺ ions 3=12252
- He, 0.5 mm Hg, positive column, helical instability, in mag. field 3=16915
- He-O, afterglow, electron removal 3=4064
- He, pulsed, light characteristics rel. to external mag. fld. 3=1959
- He, shock waves, magnetically driven 3=7278
- He, vacuum u.v. spectra 3=7462
- He-Xe, population inversion, Xe Doppler broadening 3=22493
- Hg-Ar, intensity decay of Hg lines 3=24236
- Hg-Ar, low-pressure positive column energy balance 3=19218
- Hg-A mixtures, positive column gradient 3=21749
- Hg-A, moving striations 3=12093
- Hg, electron energy exchange, high rate 3=24268
- Hg-inert gas, 0.5 to 10 mm press., theory 3=9751
- Hg-Kr, enhancement, by collisions 3=19190
- Hg lamp, low-pressure, spectral line intensity ratios, 1 to 400 torr 3=255
- Hg, low pressure, space-charge double layers 3=19205
- Hg, plasma, electron density, long var. 3=19204
- Hg, positive column gradient, middle pressure 3=19210
- Hg-rare-gas discharges, positive column field 3=7475
- Hg-rare gas mixtures, positive column gradient 3=21749
- Hg, rare-gas, resonance radiation, radial and total intensities 3=12764
- Hg, resonance radiation, impurity quenching 3=19938
- Hg vapour, light output, striations 3=14536
- I, hollow, spectrum excitation 3=17527
- I vapour, suppression of discharge by I¹⁹¹ 3=14553
- Kr-Hg, Xe, enhancement, by collisions 3=19190
- N₂, afterglow, Lewis-Rayleigh, decay rate 3=24244
- N₂ azimuthal discharge, whirl-like columns 3=4142
- N₂, electron avalanche transition into streamers 3=24237
- N₂ + H₂, high tension, spectr. study 3=4762
- N₂, l.p., "electron" and "vibrational" temps. 3=9763
- N₂, mass spectra of ions 3=5643
- N₂, metastable atoms and mol. production 3=2571
- N, pink afterglow, excitation mechanism 3=22486
- N, pink afterglow, u.v. component 3=22485
- N₂, plasma jet, anode spot movements 3=14539
- N, positive column, electron energy distrib. 3=4058
- in N₂, prod. of Al, Ga, In nitride films, 1-10μ, from chlorides 3=13565
- N₂, rotation excit. by electrons, energy loss 3=17578

Discharges, electric — contd

- N₂, Z-pinch, rel. to pressure 3=9762
- Na-Hg mixture, glow, level population inversion 3=8177
- Ne, anodic oscill., feedback control 3=4066
- Ne-Ar, pulsed microwave, formative processes 3=14537
- Ne, electron conc. in moving striations 3=21737
- Ne, fast-running striations, peculiar excitation 3=19195
- Ne, glow, anomalous, charge-exchange 3=19219
- Ne glow, moving striations, effect of standing stratification 3=9754
- Ne glow, positive ion prodn. by Penning mechanism 3=7474
- Ne, glow, pulsed, oscill. in spectral line intensities 3=12210
- Ne, positive column constriction 3=14549
- Ne, positive column, elec. and optical props. 3=24238
- Ne, probe noise in various regions 3=14550
- Ne, striation waves rel. to stimulated running striations 3=19191
- NO, afterglow, intensity and decay rate 3=24245
- O, afterglow, electron removal 3=4064
- O₂ and O₃-N₂ afterglows, free electron attachment 3=4009
- O, glow, ion masses, O₂⁺, O⁻, O₃⁻ 3=19183
- O₂, glow, stratified, negative ion extraction 3=4063
- O, positive column fields, 10⁻⁵-10⁻⁴ A 3=19213
- SF₆, Townsend, ion identification and mobility, by time-of-flight mass spectrometry 3=16905
- Xe, glow, anomalous, charge-exchange 3=19219
- Xe, high-pressure, radial temp. and mobility 3=19192
- Xe-Kr, enhancement, by collisions 3=19190
- Xe mixtures with H and He at 7.5-45 atm. 3=4045
- Xe-N₂-Ba, long-lived N₂ metastable state at ~8 eV 3=2618-19
- Xe, vacuum u.v. spectra 3=7462
- high-frequency
 - afterglows, electron-ion recomb. process 3=7442
 - air, l.p. electrodeless, effect of irradiation 3=1941
 - breakdown condition, secondary electron resonance 3=24264
 - breakdown in nonresonant mag. field 3=24263
 - brush, temp. meas. in transition region 3=1947
 - electrodeless, effect of irradiation, air at l.p. 3=1941
 - electrodeless, effect of irradiation, mechanism of Joshi effect 3=1942
 - electron distrib. function 3=16912
 - electron distrib. function analysis 3=369
 - force on electron of inhomog. a.c. field 3=24227
 - ionization in discharge path effect of oscill. 3=12066
 - Joshi effect, mechanism 3=1942
 - microwaves, without electrodes 3=21726
 - pulse discharge, 10 000 Mc/s, formation, and arcing rel. to electric field 3=19215
 - r.f. emission in strong mag. field 3=14535
 - ring, 60 Mc/s, elec. parameters meas. 3=21728
 - secondary electron emission in l.p. discharges 3=14551
 - standing striations, explanation 3=4043
 - stationary, recomb. and ionization rates 3=21771
 - vacuum, 25 Mc/s, electrode config. depend. 3=24228
 - Ar-Ne mixtures, electric strength 3=5647
 - Ar, quenching by SF₆ electronegative seeding 3=19237
 - Ar, spectroscopic data 3=15280
 - D, ion cyclotron waves, excitation and propag. 3=7622
 - H, ion cyclotron waves, excitation and propag. 3=7622
 - N₂, active, free electron density meas. 3=1935
 - N₂, A³₂⁺ state, diffusion, lifetime 3=17579
 - Ne, in column excited at one end, velocity of ionization front 3=4037
 - Ne-Ar in pulsed microwave fields, electron density build-up 3=12086
 - O₂, microwave discharge, net ionization freq. 3=9723
 - Xe, repetitive, spark channel explosions 3=1950
- Disperse systems
 - See Aerosols; Colloids; Emulsions; Foams; Powders; Sols; Suspensions.
 - atmospheres, spherical, theory 3=23592
- Dispersion, acoustic
 - gases, rel. to spectral line breadth and viscosity 3=16660
 - nitrogen, up to 500 atmospheres, 500°C 3=7242
 - in ocean bottom layer 3=6950
- ultrasonic
 - dispersive strip delay-line 3=14259
 - ethylene-SF₆ mixtures 3=6434

Dispersion, acoustic — contd
ultrasonic — contd

- furan, molecular structure 3=21354
 methyl ether—methyl chloride mixture 3=6434
 methyl ether, mixtures with CCl_4 , F_2 and SF_6 3=6434
 naphthalene, molecular structure 3=21354
 pyridine, molecular structure 3=21354
 quinoline, molecular structure 3=21354
 styrene, molecular structure 3=21354
 thiophene, molecular structure 3=21354
 in waveguides, metallic water-filled cylinders 3=18925
 C_2F_4 , mixtures with CHF_3 , CF_4 and SF_6 3=6434
 NH_3 , vibration relax. study 3=22567
 ND_3 , vibration relax. study 3=22567
 PD_3 , vibration relax. study 3=22567
 PH_3 , vibration relax. study 3=22567

Dispersion, optical

- See also Optical constants; Refractive index, light.
 absorption and dispersion, relation between 3=19001
 anthracene, dilute solutions, Kramers—Kronig relation 3=16627
 bromoform, liquid, 630-800 cm^{-1} 3=18817
 crystals, in exciton transition region 3=15668
 crystals, propag. direction depend., phonons and excitons 3=20431
 crystals, supplementary light waves 3=20429
 exciton absorption region, for O_6 and C_{6v} symm. 3=25431
 and masers, frequency shift, resonant 3=17086
 molecular crystals, rel. to saturation effect 3=20455
 molecular crystals, rel. to vibration states 3=23037
 observation using optically-dense dispersive media 3=10911
 oxide glasses, 0.4-5.3 μ 3=20439
 phenanthrene, in exciton absorption band region 3=20494
 prisms and prism combinations, formula 3=242
 rotation, effect of paramag. enhanced singlet—triplet transitions 3=19971
 sapphire, synthetic, 0.265-1.586 μ 3=2992
 variation with wavelength, effect of angle of prism 3=21520
 CdS, reflection bands obs. 3=15652
 KTaO_3 , dielectric, far i.r. 3=4947
 LiF, i.r., theory 3=15684
 MgO, i.r. theory 3=15684
 PbS, refr. index, near absorption edge 3=25436

Dispersion relations

- See also Field theory, quantum; S-matrix theory.
 α — α scatt., low-energy, Regge poles 3=4477
 acnodes on unphysical sheets 3=17205
 analyticity and unitarity conditions 3=5938
 asymptotic amplitude, unitarity 3=4349
 asymptotic behaviour rel. to baryon conservation 3=22058
 bound state problem 3=7813
 for class of nonlocal potls. 3=14911
 Compton effect on proton 3=24674
 crossing-symmetric Watson—Sommerfeld transformation 3=17220
 derivation, direct, from Riemann—Cauchy relns. 3=4350
 deuteron form factor 3=4470
 deuteron form factor, in e — d scatt. 3=2329
 deuteron photodisintegration 3=612
 different high-energy processes, correlation 3=5965
 diffraction scattering, Pomeranchuk's theorem, extension 3=24641
 double commutators, integral represent. 3=16535
 electrodynamic, electrostatic potential analogy 3=19419
 $e + d \rightarrow e + d + \pi^0$ 3=19671
 electron magnetic moment calc. 3=2242
 electron—proton scatt. 3=2244
 electron scatt. by nuclei, liquid drop model 3=8081
 elementary scatt. theory, new approach 3=7124
 Feynman diagram contributions, analytic props. 3=14865
 form factors and scattering amplitudes, review 3=24643
 and fundamental particles, equivalence, Low's model 3=17170
 fundamental particles as Regge poles 3=14862
 γ -quanta scattering by nucleons 3=2240
 γ -quanta scattering on H. rel. to expt. 3=4371

Dispersion relations — contd

- hard core due to orthogonality constraints 3=5364
 H. plasma, fully ionized 3=4123
 independent of momentum transfer, heuristic proof 3=24665
 inelastic unitarity, strip-approximation, correction estimate 3=24642
 infinite number of chain diagrams, spectral function 3=24656
 interaction symmetry prediction, "bootstrap" calc. 3=17219
 inverse amplitude, low-energy, analytic approx. 3=5950
 K-mesons scatt. in nuclei 3=10369
 ladder diagrams, investigation by complex angular momentum method 3=14883
 Λ , weak radiative decay 3=7924
 in Lee model, trivially modified 3=5947
 Levinson's theorem, relativistic extension 3=19578
 Mandelstam's programme in potential scatt. 3=10039
 Mandelstam represent., weight function on boundary of support 3=559
 Mandelstam representation, constraints imposed by unitarity 3=2211
 Mandelstam representation singularities 3=14865
 many-point functions, choice of invariant variables 3=10064
 moving poles and elementary particles 3=4345
 multichannel scatt., subtraction 3=10063
 multiple, form for many-channels process 3=17225
 $\bar{\nu}$ and ν scattering on electrons 3=2241
 nucleon and (3,3) resonance, "bootstrap" relationship 3=7841
 nucleon interactions, high-energy 3=12540
 nucleon space- and time-like momentum transfers 3=4418
 N — γ and N — π reactions near threshold 3=6032
 nucleon—nucleon scatt., coupled integral eqn. 3=10109
 nucleon—nucleon scatt., $l \geq 2$ partial waves 3=12453
 $\bar{N}N\omega$ coupling, from Regge trajectory 3=4449
 N — Θ scatt., Lee model with dipole ghost 3=10038
 one-pion exchange and optical model, corrections 3=12419
 p — p and p — n scatt. at 10 MeV 3=10116
 p — p scattering, effective radius theory, by Mandelstam rels. 3=2265
 partial-wave, analysis of solns. 3=14913
 perturbation theory, leading singularity in angular momentum plane 3=24652
 photon inelastic scatt. at nuclear Coulomb field 3=8068
 photon scatt. in nuclear Coulomb field at high frequ. 3=22363
 photoproduction of K on nucleons, π on hyperons 3=22196
 physical interpretation of unphysical region 3=22076
 plasma systems, detm. by variational technique 3=19243
 $\pi \rightarrow e + \nu + \gamma$ decay calc. 3=7885
 π -meson Green's function deriv. 3=24666
 π -meson photoprod. on nucleons 3=22162
 pion photoprod. process 3=7890
 π scatt., S and P wave scatt. lengths 3=2307
 π —hyperon resonances, in unphysical sheet 3=12483
 π — π amplitudes from boundary condition model 3=19676
 π — π , off-shell, $T = J = 1$ state 3=4442
 π — π , phase shift deduction from π — N data 3=2311
 π — π scatt., high-energy, ladder approx. 3=2315
 π — π scatt., partial-wave amplitudes 3=2309
 π — π scatt., $T = 1$ and $T = 0$ 3=2310
 π —nucleon, consistency, rel. to amplitude zeros 3=564
 π — N coupling const. 3=4435
 π —nucleon, effect of π — π interact. 3=7905
 π — N forward scatt. amp. 3=2306
 π —nucleon forward scatt. amplitude 3=10037
 π — N , low-energy, $P_{1/2}$ and S waves 3=24778
 π — N , non-charge exchange, two vacuum poles 3=12492
 π — N resonance, $J = \frac{3}{2}$, $I = \frac{1}{2}$, theory 3=12491
 π — N scatt., s and p-wave, low energy 3=2310
 π — N scatt., s, p wave scatt. amps. 3=2308
 π — N s-wave scatt. amplitudes 3=7900
 plasma oscillations, relativistic 3=7612
 Pomeranchuk—Regge trajectories, two, conjecture 3=7805
 potential scattering, impulse approx. 3=5951
 quantum electrodynamics 3=22051
 Regge asymptotic amplitudes, simplicity 3=17214

Dispersion relations — contd

- Regge asymptotic behaviour and invariant charge 3=14892
 Regge cut, experimental test 3=24655
 Regge parameters, dynamical det. 3=13426
 Regge plane, cuts, cancelling 3=12428
 Regge pole effects and shrinkage of diff. pattern 3=19582
 Regge pole "ghost state" 3=14918
 Regge pole position, effect of spin 3=19575
 Regge pole, second trajectory, α (o) 3=19576
 Regge pole, trajectory, removal of "ghost" 3=5954
 Regge poles and Bethe-Salpeter equation 3=22087
 Regge poles, and elastic scatt. of α -particles by C 3=8130
 Regge poles, polarization in N-N scatt. 3=5995
 Regge poles, position, influence of spin 3=5955
 Regge poles in renormalizable field theories 3=17215
 Regge-Pomeranchuk trajectory and 80 $m\pi^1$ resonance 3=19572
 Regge theorem, generalization 3=5940
 Regge trajectory and reson. partial wave amplitude 3=10046
 Regge trajectory slope and π - π total cross-section 3=19573
 renormalization group Regge behaviour 3=22091
 ρ -meson, Regge trajectory, non-linearity 3=6078
 role of counterterms of renormaliz. theory 3=563
 scattering amplitudes, high energy, Mandelstam representation 3=2221
 scattering phase shift, momentum depend. 3=7807
 scattering of photons by nuclei 3=8069
 scatt., pion-nucleon 3=5944
 and scattering, π - p diff. peak 3=17321
 scattering, three-body, non-relativistic. discontinuities across cuts 3=12427
 semiconductors, interband transitions in magnetic field 3=10744
 Σ^+ , weak radiative decay 3=7934
 singularities, anomalous, in physical regions 3=5953
 singularities of 2nd type, physical sheet properties 3=4351
 square diagram, with anomalous mass ratio, integral representation 3=24651
 stable and unstable particles, scattering, in perturbation theory 3=24632
 three-pion system, S-wave interaction 3=12482
 two-channel process, residues of scatt. amplitudes 3=4344
 two-particle, analytic continuation in ang. momentum 3=2205
 two-particle approx., linear eqns. 3=7810
 unsubtracted, rel. to strong interact. coupling constants 3=4342
 variational wave functions, hypervirial theorems 3=7128
 vector mesons as Regge poles, in higher order perturbation theory 3=22153
 vertex functions of $NN\pi$, ΔNK and $\Lambda K\pi$ 3=19555
 vertex functions, π -nucleon, majorising 3=15020
 vertex parts, integral representation 3=14889
 weak decays and final-state interactions 3=17161
 weak interactions, unsubtracted dispersion relns. 3=2197
 Yukawa coupling const. calc. 3=10051

Dissociation

- See also Heat of dissociation; Ionization; Molecules, dissociation.
 calcium acetate, in soln., rate, from u.s. absorpt., errata 3=5439
 gas, ideal supersonic jet 3=11815
 gas, turbulent boundary layer props. 3=3819
 gases, rel. to thermal conductivity 3=3831
 ideal gas, Prandtl-Meyer expansion 3=21439
 magnesium acetate, in soln., rate, from u.s. absorpt., errata 3=5439
 methane, ionization growth 3=24214
 oil, by elec. field 3=11865
 oxides, oxygen pressure series of chem. potentials 3=3391
 propane, radiolysis, rare-gas sensitized 3=3409
 selenious acid, molten, detection of H_2SeO_5 3=137
 strontium acetate, in soln., rate, from u.s. absorpt., errata 3=5439
 thermal, along dislocations, kinetics 3=8958
 $CaSO_4$, gypsum, dehydration study 3=25287
 CdD, rel. to u.v. band system 3=2612

Dissociation — contd

- CdH, rel. to u.v. band system 3=2612
 $CoSO_4$, solutions, aqueous, and absorpt. of acoustic waves, u.s. 3=14160
 FeO , iron-rich, phase transformations 3=11200
 $GaAs$, dissociation pressure 3=25815
 GaP , dissociation pressure 3=25815
 H ions, negative, in cyclotrons, synchrocyclotrons 3=5737
 H^- ions in elec. field, mean life 3=12083
 InP , dissociation pressure 3=25815
 N_2^{3+} , by electron impact 3=21702
 N_2^{2+} ions 3=21719
 NH_4NO_3 , thermal, catalysed by $NaCl$ 3=3398
 NO_2^{16} , photolysis, 4047 Å, temp. var. 3=25833
 O/O_2 , atmosphere, 100-135 km, by mass spectrometer, rocket-borne 3=18522
 SO_2 , in soln., ionic, rate, from u.s. absorpt., errata 3=5439
 VC , solid, pressure, 2346-2545° K 3=1386
 W surface, effect of BaO beam 3=23541
electrolytic
 See also Ions, electrolytic.
 weak, study by dielec. loss meas. 3=5447
Distillation
 See also Isotope separation.
 ammonia, deuterium enrichment 3=8940
 nitric acid-water azeotrope, in H isotope separation 3=715
 sea-water, using fast reactor 3=19902
 solar distillers of green-house type 3=5555
Domains
 See Ferroelectric phenomena; Magnetization state; Superconductivity.
Doppler effect
 deuterium plasma in Scylla, X-ray lines 3=7581
 e.m. wave reflected by magnetization wave in ferrites 3=4269
 e.m. waves in ionosphere, satellite meas., analysis 3=3495
 particle beam, charged, velocity effect in plasma 3=5687
 radio waves, in artificial satellite tracking 3=3632
 radiowave shift in ionosphere 3=13722
 relativity, general, group motions, and Müssbauer effect 3=16513
 in Schwarzschild universe 3=14011
 semiconductor plasma, pinched, moving, e.m. waves 3=17827
 slow neutron interaction with crystal structure at low temp. 3=4801
 $3C$ 48 radio source 3=13932
 transverse, meas. in accelerated system 3=9332
Dosimetry
 See also Radiation monitoring; Radioactivity measurement; X-ray measurement.
 atomic bomb radiation by thermoluminescence 3=12611
 $CaSO_4(Mn)$ thermoluminescence dosimeter for γ -det. 3=5078
 cavity chambers of different wall materials 3=24883
 Fricke dosimeter, oxidation efficiency for P^{32} 3=7830
 Fricke dosimeter, use of ion exchange column 3=7750
 γ -detector, small, for high intensity 3=17235
 γ -dosimeter abs. calibration, by calorimetry 3=574
 γ -ray background in atmosphere 3=9055
 gamma-rays, dose-rate outside spherical source 3=10279
 γ -ray, sensitivity, 15-300 MeV 3=5977
 γ -rays, using gas discharge counter 3=14945
 LiF , thermoluminescent 3=17116
 luminescent, air-equivalent, temp. var. 3=17117
 neutron, of body Na^{24} activity 3=21151
 n , fast, Si rectifier, n^+-p-p^+ , diffused 3=24816
 neutron, with LiI crystal in polyethylene moderator 3=2282
 neutron, new emulsion with increased gelatine 3=24569
 neutrons, review, all energies 3=17292
 neutron, slow and fast, by selective fission fragment track registration 3=24752
 optical rot., for Co^{60} γ -facilities 3=19799
 oxalic acid, for in-pile use 3=22453
 pen, characteristics, X-ray (up to 300 kV) and n responses 3=22045
 photographic film, use of secondary electron emission 3=14831

Dosimetry — contd

- primary collision efficiency, rel. to neutron energy 3=10423
- Ra in soln., microdosage using nuclear emulsion 3=4582
- reactor radiation, isothermal calorimeter 3=696
- recommendations, ICRU 3=24878
- space vehicle radiations 3=24557
- thermoluminescent devices, phosphorescence method of reading 3=23133
- thermoluminescent, reading system 3=19511
- X-ray isodose plotter 3=19391
- NaI:Tl as density amplifier in radiation surveys 3=2170
- NaI:Tl dosimeters in radiation surveys 3=2170

Double refraction

- See also Electromagnetic wave propagation; Optical constants; Optical rotation; Polarized light.
- acetone, rel. to shock waves 3=7205
- alkali halide crystals, rel. to stress/strain relationships 3=22649
- in crystals, additional light waves in exciton absorption region 3=10913
- crystals, birefringence surfaces and optical indicatrix 3=20444
- crystals, edge dislocations arrays, colour contrast 3=7351
- crystals for prodn. of γ -ray circ. polarization 3=14937
- effects, obs. using optically-dense dispersive media 3=10911
- n-heptane, rel. to shock waves 3=7205
- liquids, induced by u.s. waves, theory 3=1687
- magnetic, in diamag. fluids, mol. theory 3=3815
- materials research appl. 3=13320
- metallic vapours with oriented atoms 3=4714
- methanol, rel. to shock waves 3=7205
- polymers, cryst., anisotropy theory 3=917
- quarter-wave plate, composite, theory 3=9627
- semiconductors, by free-carriers 3=10912
- 2, 2, 4 trimethylpentane, rel. to shock waves 3=7205
- water, rel. to shock waves 3=7205
- $\text{Ca}_2\text{Sr}(\text{C}_2\text{H}_2\text{CO}_3)_2$ 3=20445
- CdSe, rel. to Ga doping 3=915
- KCl-NaCl mix crystals, on decomposition, at dislocations 3=12985
- NH_4 fluoroberyllate, temp. depend. 0-150°C 3=17981
- $(\text{NH}_4)_2\text{SO}_4$, temp. depend. 0-150°C 3=17981
- NaCl-KCl mix crystals, on decomposition, at dislocations 3=12985
- $\text{NiSO}_4 \cdot 6\text{H}_2\text{O}$, u.v., visible, near i.r. 3=20446

flow

- macromolecular solns., dimensions of coil 3=21348
- macromolecular solns., orientation in shear flow and elec. field 3=16617
- measurement, photoelec. compensation 3=16811
- poly-i-butylene-benzene solns. 3=21352
- polymer solns., anisotropy 3=16618
- polystyrene-cyclohexane solns. 3=21352

electric

See Electro-optical effects.

magnetic

See Magneto-optical effects.

mechanical

See also Photoelasticity.

- Capron fibres, rel. to tensile strength 3=23045
- epoxy resin in compression up to 6 ton in^{-1} 3=25440
- films adsorbed on stressed metal surfaces 3=4962
- nylon 3=23494
- poly- γ -benzyl-L-glutamate, concn. soln. 3=5441
- polyethylene 3=23494
- polyethylene, dynamic birefringence 3=10915
- polypropylene fibres, rel. to tensile strength 3=23045
- polymethyl methacrylate, rel. to stretching 3=17982
- polymethyl methacrylate, rel. to tensile strength 3=18207
- polytetrafluoroethylene 3=23494
- rod-shaped mols. soln. theory 3=5441
- rubber 3=23494

Drops

- atomizer, vibrating capillary, construction and operation 3=13981
- attenuation of sound 3=14261
- p-azoxybenzoate, liquid crystal, smectic, growth 3=21313
- breakup by air blasts 3=23859

Drops — contd

- cloud droplets, collision efficiency in electric fields 3=13677
- coalescence, two liquid systems, states 3=23858
- conducting droplet under action of surface tension and e.s. forces 3=14503
- crystal nuclei formation 3=5081-2
- in electric fields, falling 3=7417
- electric potential, falling under gravity 3=355
- electrically charged, stability 3=9432
- evaporation, effect of heat transport 3=7391
- falling, elec. potl. acquired 3=7217
- fog droplet distributions 3=1436
- formation at nozzle tips, Plateau's spherule to drop diameter relation 3=23856
- formation by u.s. excitation of liquid surface 3=23850
- internal circulations 3=14133
- liquid, at liq.-liq. interface, equil. shape 3=11773
- liquid, coalescence process under voltage 3=14131
- liquid, production, photographic study 3=23857
- liquid sprays, size analysis by sedimentation 3=11363
- in mist, over liquid, dynamic equilibrium 3=5556
- movement in liquids, due to surface active substances 3=5426
- oscillation and deform. on falling through water 3=7196
- rain, coalescence, allowing for condensation 3=16217
- rain, evaporation 3=9040
- rain, size distribution, var. during fall 3=13672
- sessile, formula for height 3=14134
- water, 15-500 μm radius, prod. by vibrating capillary 3=14132
- water, Leidenfrost phenomenon at 100°-500°C 3=7389
- water, shapes under low gravity 3=18668
- water, vapour-exchange with environment 3=294

Drying

- acoustic, in standing sound wave. 3=218
- heat and mass exchange during drying 3=1866

Dusts

See Aerosols; Powders.

Dynamics

- See also Ballistics; Kinematics; Rotating bodies; Vibrations.
- acceleration, reduced, arbitrary order, theory 3=18771
- action principle, Lorentz-invariant, nonlinear 3=18767
- angular momentum in quantum mechanics 3=11689
- batting a ball, velocity vectors 3=21268
- centre-of-mass, photographs 3=11739
- centripetal force apparatus for teaching 3=11655
- classical and quantum, unified variational formulation 3=7112
- classical and quantum, unified variational formulation 3=14027
- classical, rel. to minized quantum action 3=1615
- "dynamation", defin. and proposal of word 3=3775
- focusing fields 3=11745
- gyrocompass, horizontal 3=23821
- Hamiltonian system with time-depend. forces, perturb. theory 3=23820
- impact, perfectly elastic, of material systems 3=1645
- mechanical impedance, mobility, analytical expressions 3=7259
- motion of a rigid body in a Newtonian force field, Poincaré theorem 3=23818
- motion of systems with Coulomb friction 3=1647
- moving coordinate system, tensor density, local derivative 3=23728
- orbit generation by generalized Hill curves 3=16565
- particle, demonstrations with simple spring gun 3=5399
- point mass movement under central force action 3=9384
- point with variable mass moving in rarefied resistive medium 3=21269
- quantum-classical reln., continuous represent. theory 3=21231
- rigid strip mass on an elastic half space excited by a seismic wave 3=18770
- satellite motions, orbital and attitude 3=16433
- solid state, with constraints 3=9385
- sphere in sound field, force on, motion of 3=18909
- stability condition 3=3776
- stability of motion, use of several functions 3=18769

Dynamics — contd

- synchronous orbits of sphere, ellipsoid, in orbital plane, stability 3=11494
- third integral of motion 3=11492
- three-body problem, librations near triangular point 3=11743
- three-body problem, zero velocity curves and orbits 3=11742
- three-body problem with neg. energy const. 3=7162
- time and energy as conjugate variables 3=21208
- 2-dimensional motion demonstration 3=9383
- two fixed force-centres, matched-conic approx. 3=11493
- unstable systems, transitory movements, and sun, granules 3=18630
- vibration—impact system, model tests 3=23823
- virtual work, generalized principle 3=9386
- wear particle, viscoelastic, between sliding surfaces 3=16564
- weight on a string, angular momentum non-conservation 3=11740

Dynamometers

See also Force measurement.

No entries this year

Dysprosium

- antiferro—ferromag. transition at 86°K and crystal structure 3=15755
- atom, spectrum, isotope effect 3=15282
- elastic constants, temp. var. 3=6711
- electrical conductivity, 4·2-350°K 3=25322
- ferro—antiferromagnetic transform, exchange interaction mechanism 3=20573
- ferromag. screw structure and transitions 3=975
- ferromagnetic—antiferromagnetic transition, crit. fld. meas. 3=17022
- ferromagnetic resonance, spin-wave theory 3=20635
- films, resistance, spin-ordering effects 3=15547
- foils, neutron flux meas. 3=2283
- Hall effect, 4·2-350°K 3=25322
- mag. susceptibility, 300°-1500°K 3=11033
- magnetic and magnetoelastic props., temp. depend. 3=5017
- magnetic phases, spiral structure model 3=3075
- magnetization—temp. data 3=25507
- magnetostriction, rel. to helical mag. structure 3=6716
- magnetostriction, large 3=20550
- magnetostriction, large, in temp. range including Néel and Curie points 3=20551
- magnetostriction, temp. var. 3=6711
- lattice parameters, temp. depend. 3=15444
- paramagnetic—antiferromagnetic phase transition 3=20552
- spin waves, spectrum and specific heat, theory 3=3095
- thermal, contraction and magnetostriction, large 3=20551
- Dy³⁺, electron structure, free in cryst. field 3=8377
- Dy³⁺ in soln., near i.r. transitions 3=23885
- Dy³⁺ levels in LaCl₃, crystal field splitting 3=2692

Dysprosium compounds

- ferrite garnet, etching 3=18240
- DyAl₂, mag. moment and Curie pt. 3=991
- Dy₂Al₂O₇, specific heat anomaly near Néel temp. 3=15436
- DyCl₃·6H₂O, paramag. relax., 1·1-4·2°K, 2-2660 c/s 3=8719
- DyCl₃·6H₂O, spin—lattice relax. 1·1° to 4·2°K 3=3183
- DyFe garnet, hyperfine interact. of 2⁺ state of Dy¹⁶⁰ 3=1155
- DyFe garnet, hyperfine Zeeman splitting, 85° and 300 K 3=994
- DyH₂, magnetization—temp. data 3=25507
- DyMn₂, antiferromagnetic props. 3=15910
- Dy₂O₃, hyperfine splitting of Dy¹⁶¹ levels 3=4999
- Dy₂O₃, specific heat and thermodyn. props. 3=20106
- Dy—Y solid solutions, mag. props., var. with temp. and composition 3=15745

Ear

See also Hearing.

- acoustic input impedance meas. 3=21156
- artificial, C.N.E.T., physical definition 3=1553
- artificial, internat. standardization 3=3653
- basilar membrane displacement, calc. model 3=3659

Ear — contd

- basilar membrane freq. discrimination, circuit simulator 3=21155
- cochlea—cortex potentials, rel. to activation of afferent olivo—cochlear bundle 3=3664
- cochlea, neurophysiology and neuroanatomy 3=3660
- cochlear acting, travelling wave theory 3=3654
- cochlear models, time—frequ. analysis 3=3655
- cochlear nucleus, afferent secondary neurons, centrifugal inhibition 3=3663
- cochlear pots., response to pres. changes 3=21168
- cochlear response to transients, action potential 3=3662
- defects rel. to information transmitted 3=3682
- guinea pig, cochlear microphonic, changes by mech. factors 3=3685
- guinea-pig, middle-ear function 3=21169
- human, acoustic impedance for fresh corpse 3=9293
- middle-ear acoustic, elec. analogue 3=3667
- middle-ear mech. rel. to deafness surgery 3=3666
- middle ear muscle function at moderate sound levels 3=5286
- middle, motion following square impulse 3=9299
- monkey, rhesus and squirrel, cochlear potentials 3=3684
- monkeys, peripheral and central system, neural mech. 3=3683
- nonlinearity as subharmonics source 3=16445
- organ of Corti, hair cells, morphological polariz. 3=3656
- protective devices, threshold shift testing 3=1557
- sensory hairs of inner ear, structure and function 3=3657
- stapedectomy operation for otosclerosis 3=16446
- tectorial and basilar membranes, nature and structure 3=3661
- travelling-wave envelope dims., in four species 3=3658
- vestibular system, inhibition, rel. to hearing 3=3665

Earth

See also Geodesy; Geophysics.

- central density from P seismic wave velo. 3=16193
- convection currents on mantle 3=11377
- core, eddy motion and geomagnetic field non-dipole, lifetime 3=13646
- core rigidity and fundamental oscillations 3=13643
- crust, development and ϵ_{r40} in atmosphere, from K⁴⁰ 3=13648
- deformation in interior, several models. 3=25859
- deformation under surface mass loads, Green's function 3=13635
- diffusion of matter in interior, ionic substitution 3=18479
- earth—moon problem, plane restricted, periodic librations 3=7021
- e.m. wave propag. in geological conductors 3=9944
- expansion, rel. to gravitation const. decrease 3=5177
- finite deformation in interior 3=13644
- groundwater flow with free surface, models 3=7189
- hydrodynamic model and gravity 3=16188
- interior model, core, thermal history 3=16336
- mantle, plastic layer at 37-155 miles depth 3=1419
- mantle, soft layer detection by Rayleigh wave phase, possibility 3=18472
- meteor impacts, frequency versus mass for stoney and Fe meteors 3=13874
- meteorite impacts, ocean basins, lopoliths and lunar maria 3=11384
- Mohorovičić discontinuity, nature 3=18481
- mountain formation, theory. 3=25860
- ocean basins, dimensional correl. with lunar maria 3=16332
- oscillations, effect on pendulum 3=23562
- pulsations, vertical, and solar activity 3=16190
- radial oscillations, attenuation 3=9007
- surface features, ring structures, S. Australia, and lunar grid system 3=16333
- thermoelastic stresses distrib. 3=23563
- tidal evolution of earth—moon system 3=21092
- torsional oscillations, surface displacement 3=11379
- torsional oscillations theory, reverse problems 3=9006
- vibrations, free, spheroidal, long-period, calc. 3=18468-9

See also Radioactive dating.

- Devonian sedimentary rocks, paleomag. subdivision 3=21078

- Earth — contd**
composition
 continents, thickness 3=13640
 core boundary, elastic parameter and density variation 3=13645
 core, hypothesis, rel. to Fe eqns. of state 3=8372
 density gradation, cryoscopic effect 3=23572
 F-layer, and core, convection and crystallization 3=23571
 internal structure and oceanic tides 3=21025
 tektites, selective volatilization 3=9015
 upper mantle 3=21026
- electricity***
 conductivity electrical, relative, horizontally stratified earth calc. 3=16195
 conductivity of outer mantle 3=23573
 earth currents, S variation, rel. to mag. fld. variation 3=23579
 and explosions, nuclear, high-altitude, (July 9, 1961) 3=11381
 electromagnetic core-mantle coupling 3=13823
 e.m. field, natural, effect of fault 3=5184
 e.m. field structure, 0.5-100 c/s 3=9121
 magneto-telluric fields, theory and origin 3=1477
 magnetotelluric invest., induction pick-ups 3=9122
 natural field Pt oscillations, short-period, at sea 3=3438
 noise, man made, ~ 1 sec period 3=23578
 nuclear explosions, underground, e.m. signals 3=11380
 potentials, downward, calc., non-cond. basement 3=16197
 rocks, temp. depend. of dielectric const., loss 3=23574
 surface potl. distrib. due to direct-current point source 3=9005
 surface potential, horizontally stratified earth 3=16196
 telluric current micropulsation bursts 3=23575
 telluric-current micropulsations, $T < 20$ seconds, in auroral zone 3=18482
 telluric currents, assoc. with ionospheric currents, aurora and geomag. activity 3=13832
 telluric currents, conjugate point relationship at high latitudes 3=13711
 variations, due to nuclear explosion, high-altitude 3=13841
 vertical resistivity profiling, magnetotelluric method 3=13821
- heat**
 borehole temp. meas. equipment 3=21023
 generation by tidal friction 3=21092
 history, and model, interior, core 3=18336
 i.r. flux and surf. temp. Tiros II meas. 3=1411
 radiation balance, Explorer VII data 3=23568
 radiation balance, Tiros II data 3=23567
 radiation field, upward, correl. with temp. field 3=23585
 radiation leaving, determination 3=3437
 radiation refl., ang. and spectral distrib., theory 3=23585
 radioactive, effect on shape under rotation and gravity 3=16188
 surface temp., desert, and i.r. radiation, Tiros III 3=18493-4
 surface temp., diurnal variation, rel. to radiation 3=16189
 thermal radiation, ang. distrib., theory 3=23564
 thermal radiation, flux onto differently oriented surfaces 3=23569
 thermal radiation into space, rocket meas. 3=23566
- magnetic field**
 analysis of dipole and non-dipole components 3=1482
 anomalies, integrals, rel. to disturbing body 3=18569
 anomaly, Capetown and cosmic-ray neutron vars. 3=17375
 atmosphere, upper, hydromagnetic waves, freq. cut-off 3=16304
 Belgium (Dourbes) 1962, daily obs., tables 3=16299
 boundary 3=18570
 boundary conditions, choice 3=6998
 boundary with solar wind, location, correction 3=16307
 boundary, in steady solar wind, unifor pressure effect 3=13828
 Chapman-Ferraro surface, detailed shape 3=1476
 compensation in iron-free spectrometer 3=19399
 compression, theory 3=13825
 conjugate ionosphere to F2 reduction and eclipse, solar 3=23624
 control of astronomical satellite scintillations 3=21077
- Earth — contd**
magnetic field — contd
 core-mantle coupling 3=9124
 declination, effect on F2 layer 3=23622
 dipole, non-central, radiation belt data 3=9107
 dispersion due to secular varn. for remote times 3=1484
 distant field, disordered structure 3=16296-8
 Doppler shift of satellite radio transmissions, effect on 3=6997
 dynamo theory, expt. test 3=18566
 electrojet field, in Nigeria 3=25938
 effect of extraterrestrial plasma streams 3=18568
 electromagnetic core-mantle coupling 3=13823
 e.m. field, natural, effect of fault 3=5184
 e.m. field structure, 0.5-100 c/s 3=9121
 equatorial electrojet, longitude variation 3=6999
 and E-region irregularities, vertical distrib. 3=11437
 Explorer 10 measurements, 1.8 to 42.6 Re, March 1961 3=11466
 extrapolation into magnetosphere using spherical harmonic motion 3=13824
 Fe core, Curie temperature, rel. to electron 3p to 3d-4s shell transfer 3=25936
 geomagnetic quadrupole field 3=16295
 Great Dyke, S.Rhodesia, palaeomag. 3=11480
 induction magnetic pickups 3=13820
 interaction with e.m. signal from nuclear explosion 3=7717
 interactions with ionosphere 3=13705-6
 interactions with solar plasma, theory 3=13819
 interaction with solar wind, interplanetary mag. fld. effect 3=25958
 interface with solar wind, 2nd approx. calc. correction 3=21072
 interface with solar wind, stability 3=21071
 magnetic storm induction, theory 3=9123
 magnetogram reader, semiautomatic 3=11463
 magnetosphere dynamics, impedance transfer concept 3=13838
 magnetosphere-solar wind interaction 3=9134
 magnetospheric interchange instability 3=11464
 magneto-telluric fields, theory and origin 3=1477
 magnetotelluric invest., induction pick-ups 3=9122
 main field as cumulative result of disturbances 3=13826-7
 meas. by n.m.r. of liquids 3=21420
 meas. with d.c. Rb⁸⁷ and proton free-precession magnetometers 3=8190
 model, analytic, series 3=18565
 Newton integral transform, inversion 3=1583
 nomenclature 3=16294
 origin 3=23643
 origin, in vortex motion of fluid in const. 3=18567
 outer atmosphere artificial electron injection as research aid 3=16238
 precessional torques, as cause 3=21070
 proton belt (quiet-time) distortion 3=1492
 protons, trapped, asymmetry effects at high energy 3=16292
 radiation belts, ring current 3=16293
 ring current growth, rel. to quite auroral arcs 3=6995
 and rotation, fossil 3=11465
 S and L in low-latitude region, comparative study 3=13829
 solar corpuscular flux, hollow 3=9120
 space research, review 3=25937
 and sun, radiation, corpuscular, interaction 3=24288
 tables, Ottawa 3=13822
- magnetic field, variations**
 See also Magnetic storms.
 activity, rel. to v.h.f. backscatt. data 3=9080
 activity under electrojet 3=25939
 annual, solar control 3=16300
 anomal., mass and depth meas. 3=18470
 anomaly trend and spacing patterns 3=21073
 April-June 1961, rel. to solar activity 3=13886
 bomb, high-altitude, effects, July 9, 1962 3=11474
 and core, eddy motion, non-dipole lifetime 3=13646
 correlation with solar filaments vanishing 3=11467
 current systems due to non-periodic winds 3=3491
 daily, S^F field in polar region 3=9129
 q

Earth — contd

magnetic field, variations — contd

- declination, annual change, Western Scandinavia and North Sea 3=11468
- dipole, northward shift, and quadrupole stability 3=25944
- disturbance lines, prediction 3=25952
- disturbance, rel. to auroral X-ray event 3=23630
- disturbances, catalogue, July 1961 3=18529
- disturbances, during IGY and IIPY, gross nature 3=11473
- disturbances, dynamo theory 3=3490
- disturbances, from nuclear explosion, July 9, 1962 3=23649
- disturbances, moon influence 3=13840
- disturbances, rel. to auroral zone chorus bursts 3=1481
- disturbances, rel. to ionosphere jet current 3=5212
- disturbances rel. to simultaneous auroral luminosity 3=23634
- diurnal, lunar effect near equator 3=9128
- due to electrons, high energy, from nuclear explosions 3=9085
- due to explosion, nuclear, high-altitude 3=16306
- effect on ionization drift in ionospheric F-region 3=13763
- effects of trapped high-energy ions 3=23641
- equatorial, lunar and solar geomag. tides 3=1479
- equatorial, 26-27 month periodicity 3=5225
- and explosion, nuclear, high-altitude, short time delay 3=23616
- explosions, nuclear, high altitude, double impetus 3=25961
- flare-storm time delays, effect of pre-storm conditions 3=7002
- fluctuations with frequencies of torsional oscillations 3=23645
- fluctuations, in regions remote from high-altitude nuclear bursts 3=23646
- geomagnetic activity, assoc. with aurora ionospheric and telluric currents 3=13832
- giant, and pulsating aurora 3=25956
- H and D components, conjugate point relationship at high latitudes 3=13711
- hydromagnetic waves, generated by nuclear explosion, July 9, 1962 3=21075
- index K p and cosmic rays, semidiurnal amplitude and phase 3=17374
- intensification rel. to ionospheric turbulence 3=3516
- ionospheric storms, SD and Dst variations 3=23609
- irregular, in H field 3=1488
- K-indices of geomag. activity, March-April 1963 3=25950
- K-indices, diurnal varn. on disturbed days, 1949-57 3=9126
- K_p index, rel. to plasma and mag. pressure 3=23651
- low-latitude region, solar daily variation 3=1480
- lunar semi-diurnal and sudden commencements 3=25949
- lunar semidiurnal, Cape Town and Hermanus 3=23644
- magnetohydrodynamic wave obs. by 1959 62 (Explorer 6) 3=9127
- measurement, 0.1-10 c/s 3=18572
- meteor effects 3=13844
- micro, nomenclature 3=25953
- micropulsations, in auroral zone, rel. to conjugate-point studies 3=25957
- micropulsations, at Brisbane, Queensland 3=13833-4
- micropulsations, fine structure, trapped particle theory 3=25954
- micropulsations near coastline, polarization 3=9928
- micropulsations, from nuclear explosion, July 9, 1962 3=23650
- micropulsations, pearl-type, fine structure 3=13831
- micropulsations, in Philippines 3=25940
- micropulsations, rel. to nuclear explosion, over Johnston Is. 3=23647-8
- micropulsations, review 3=485
- model, e.m. waves incident on stratified earth 3=4243
- motions, damping by ionosphere 3=25959
- near magnetic equator, disturbance daily variation 3=25941
- 1932-1961, rel. to sunspot cycles 3=16308
- nuclear detonation effects 3=13843
- due to nuclear explosion, high-altitude 3=13841
- nuclear explosion, high altitude, 4 July 1962, effects of 3=25925
- due to nuclear explosion, July 1962 3=3517

Earth — contd

magnetic field, variations — contd

- nuclear explosion, July 9, 1962, effects, obs. in Peru 3=25960
 - due to nuclear explosion, megaton, 320 km 3=9133
 - nuclear explosions, underground, effect on e.m. signals 3=11380
 - palaeomag. secular variations 3=3521
 - pearl oscillations, frequency analysis 3=1486
 - periodicities, Huancayo, Peru 3=16301
 - polar disturbances, effect of extra-terrestrial particle streams 3=13830
 - pulsations in auroral zone, rel. to v.l.f. emissions 3=11472
 - pulsations, rel. to hydromag. waves in exosphere 3=1485
 - pulsations, short-period, due to trapped charged particles 3=25955
 - rapid fluctuations, spatial distrib. 3=1487
 - rapid fluctuations, spatial distrib. analysis 3=13837
 - rel. to earth current S variation 3=23579
 - relationship with ionospheric variations 3=13759
 - relation to telluric currents 3=7000
 - Sept-Dec. 1959, Vanguard 2 obs. 3=9125
 - similar, at geomag. conjugate points 3=16237
 - small rotations, mag. interference calc. 3=9130
 - solar daily, new longitude effect 3=25942
 - solar eclipse, 15 Feb 1961, geomag. effect 3=25963
 - solar wind flow, direction, effect 3=7003
 - sun flares, and cosmic ray, neutron vars., crotchets 3=22249
 - and sunspots, N-S difference, lack of relation 3=18575
 - tidal effect, semidiurnal and geomag. lunar tide 3=25943
 - time-lag between ionosph. and geomag. changes 3=3489
 - time variation models, by palaeomag. methods 3=1483
 - very slow variations, meas. apparatus 3=1478
 - world-wide changes, equatorial enhancement rel. to SC 3=11470
- rotation**
- axis stability and phase changes 3=9008
 - electromagnetic core-mantle coupling 3=13823
 - and geodasy, on hydrodynamic model 3=16188
 - and magnetic field and rock magnetism 3=11465
 - meteor collisions, large, and axis changes 3=21022
 - and meteorite impacts, giant 3=11384
 - vortex, bath tub, effect 3=9430

Earth satellites

See Satellites, artificial.

Earthquakes

See Seismology.

Echo

See also Architectural acoustics; Reverberation; Sound ranging.

rigid body in fluid, optical anal., errata 3=5501

Eclipses

- annular, April 1958, lunar profile meas. 3=9177
- radio emission during, 15 Feb. 1961, 1.5-4m 3=1539
- solar, effect on ionosphere F2-region 3=13757
- solar, effects on e.m. wave propag. in ionosph. 3=6979
- solar Feb. 1961, Catania observations 3=9192
- solar, 15 Feb. 1961, corona study 3=9218
- solar, 15 Feb 1961, geomag. effects 3=25963
- solar, Feb. 1961, inner corona meas. 3=18636
- solar, Feb. 1961, ionospheric f_oF meas. 3=25929
- solar, 15 Feb. 1961, latitude and longitude of obs. station 3=9191
- solar, Feb. 1961, photographs of corona 3=1518
- solar, 4-5 Feb. 1962 3=18626
- solar, Feb. 1962, corona brightness meas. 3=18637
- solar, Feb. 1962 coronal condensation 3=9219
- solar, January 25 1963, predicted path 3=3564
- solar, and ionosphere foF2 reduction, at mag. conjugate point 3=23624
- solar, isomorphic regions 3=1517
- solar, relativistic deviation meas. 3=3731
- 12 October 1958, polarigraphic obs. of corona 3=1519

Eddy-currents

- Alumel, effect on hysteresis loops 3=15790
- cylindrical conductor, transient processes due to external mag. field 3=2082
- ferromag. plates at saturation 3=23149
- interaction with nonuniform mag. field 3=1907
- magnetic fields, by complex successive overrelax. 3=20277

Eddy-currents — contd

- metal plate, free-electron theory 3=13039
- plate parameters meas. in mag. field 3=9902
- steel, var. with grain size and Si content 3=10727
- Fe, effect on hysteresis loops 3=15790
- Si-Fe, eddy-current losses, calc. from domain wall data 3=15800

Einsteinium

No entries this year

Elastic constants

See also Compressibility; Stress/strain relations.

- adsorbed layer, effect of surface H bonds 3=6897
- alkali halide crystals, Cauchy's reln. theory 3=25600
- alkali halides, Cauchy relns. failure 3=8750
- alkali halides, temp. var., high temps., calc. 3=20687
- body centred cubic crystal, anisotropy meas. 3=10654
- carbon brush materials 3=20761
- corundum, variation with temp. 3=13327
- crystals, centro-symmetric, temp. var., calc. 3=20687
- crystals, invariant parameters for tensors 3=13324
- diamond, shear, variation under high-pressure 3=23375
- electrographite 3=8787
- f.c.c., for arbitrary central forces by method of long waves 3=18158
- f.c.c., third-order, rel. to coupling parameters 3=3208
- ferromagnetic metal, effect of 60 c/s mag. field 3=15970
- glass, optical, temp. var. 3=5058
- graphite, pyrolytic 3=13321
- graphite (pyrolytic), from lattice vibrations 3=2710
- lattice, rel. to second and third-order force consts. 3=4804
- metals, calc. using Rydberg potential 3=4800
- metals, cubic, temp. depend., electron contrib. 3=25603
- metals, magneto-polarized, dynamic moduli 3=25606
- minerals limestones, Tandur, Young and torsion moduli by u.s. 3=15973
- pentacerythritol 3=8749
- polyacrylonitril, fibres, temp. depend. 3=23358
- polycaprolactame, fibres, temp. depend. 3=23358
- polycrystals, preferential grain orientation effects 3=20686
- polycrystals, quasi-isotropic, calc. 3=5056
- polyethylene terephthalate, dynamic elastic moduli 3=8754
- polyethylenes, shear, temp. depend. 3=13326
- polyethyleneterephthalate, fibres, temp. depend. 3=23358
- polymers, cryst., anisotropy theory 3=917
- polymethylmethacrylate, 50-1000c/s, -80- + 100°C 3=6776
- polypropylene, fibres, temp. depend. 3=23358
- polyvinylchloride, 50-1000c/s, -80- + 100°C 3=6776
- pyrite 3=23280
- quartz, around $\alpha = \beta$ transform. temp. 3=15990
- quartz, electric field change tensor, d.c., from reson. freq. changes 3=23009
- Rochelle salt, effects of radiation damage 3=10883
- sapphire, synthetic, at 27°C 3=11131
- semiconductors of diamond, blende, wurtzite types 3=23278
- semiconductors, diamond type 3=1214
- shear, Ni-Co alloys, effect of magnetic annealing 3=8681
- solids, Debye temp. calc. method 3=20110
- solids, pressure-dep. meas. by u.s. interferometer 3=223
- solids, relationship with thermal expansion 3=11130
- steel, shear, under pressure, annular specimens 3=6784
- steels, depend. on tensile stresses values 3=3210
- steels, effect of temp. and alloying 3=13328
- III-V compounds, rel. to lattice consts., hence Debye temp. 3=22636
- triglycine sulphate, effect of γ -radiation 3=17949
- triglycine sulphate, near Curie point 3=13323
- Young's modulus, meas., above 2000°C in vacuo, thin rod reson. 3=20693
- zincblende, shear, variation under high-pressure 3=23375
- Ag, bulk modulus, rel. to volume, calc. 3=4828
- Ag, -183° to 300°C 3=20688
- Ag, rel. to u.s. pulse propagation 3=10592
- Al, Young's modulus, pendulum method 3=11135
- Au, dynamic moduli, 4°-300°K, after deformation 3=25613
- Au, -182° to 300°C 3=20688
- BaF₂ 3=18161

Elastic constants — contd

- Ba(NO₃)₂ 3=18161
- Be, and lattice vibr. spectrum 3=10578
- BeO, room temp. 3=5057
- CaCO₃, from velo., u.s. 3=23278
- β -CaZn alloy, 4.2-800°K 3=8752
- CaF₂ 3=18161
- CdS, meas. and model 3=8556
- CdS, sphalerite form 3=18159
- CdSe, meas. and model 3=8556
- CdTe, meas. and model 3=8556
- CoO, temp. var., anomalies 3=8774
- CoSO₄.7H₂O, and crystal structure 3=20690
- Cr ferrite, alloyed with various metals, temp. depend. 3=20900
- Cr, temp. depend., anomalies 3=8753
- Cr₂O₃, temp. var., anomalies 3=8774
- CsBr at 300°, 77°, 4.2°K 3=21501
- Cu, after plastic deformation at 4.2°K 3=8757
- Cu, dynamic moduli, 4°-300°K, after deformation 3=25613
- Cu, effect of electron irradi. 3=796
- Cu, effect of neutron irradi. 3=5059
- Cu-Ag, from u.s. velo., wedge method 3=23276
- Cu-Au alloys, rel. to ordering 3=20685
- Cu-Au, from u.s. velo., wedge method 3=23276
- Cu-Ni, from u.s. velo., wedge method 3=23276
- Cu-Pb, from u.s. velo., wedge method 3=23276
- Dy, temp. depend. 3=5017
- Dy, temp. var. 3=6711
- Fe foils, rel. to dislocation movement 3=17702
- Fe, shear modulus, rel. to deform amplitude 3=6779
- Fe-Al alloy, rel. to atomic order and ferromag. props. 3=25605
- FeSO₄.7H₂O, and crystal structure 3=20690
- Ga, temp. depend. 3=5017
- GaSb 3=8751
- Ge, 0-30000 lb/in² and -195.8 to 25°C 3=11133
- Ge, effect of holes, calc., 3=20689
- KCl, rel. to temperature 3=18163
- KD₂PO₄, compliance 3=17943
- Li ferrite-chromites, Young's modulus, anomalies 3=5061
- LiH₂(SeO₃)₂ 3=10881
- Li-Mg alloys, rel. to martensitic transform. 3=5125
- Mg, and lattice vibr. spectrum 3=10578
- Mg(H₂O)₆(BrO₃)₂ 3=18161
- MgO, mono- and polycryst., kc/s meas. 3=15971
- MgSO₄.7H₂O, and crystal structure 3=20690
- MnO, temp. var., anomalies 3=8774
- Mo, 4.2°-300°K meas. 3=13325
- N₂H₄Cl₂ 3=18161
- NaCl, rel. to point defect "background" 3=17757
- NaCl type crystals, third order, temp. depend., calc. 3=18164
- NaCl whiskers 3=20804
- NaF, rel. to temperature 3=18163
- NaNO₂ single crystals 3=10885
- Ni alloys, high, from u.s. velo., wedge method 3=23277
- Ni, effect of annealing in moist H₂ 3=20722
- Ni, shear modulus, effect of mag. field 3=11141
- Ni, shear modulus, temp. var. 3=3209
- Ni, shear modulus, rel. to deform. amplitude 3=8779
- Ni-Fe, temp. depend. and anisotropy 3=18075
- Ni(NH₄)₆(NO₃)₂ 3=18161
- NiSO₄.7H₂O, and crystal structure 3=20690
- Ni-Zn ferrite 3=17652
- Pb, at low temp., rel. to Debye temp. 3=1212
- Pb(NO₃)₂ 3=18161
- PbTe 3=8751
- α -Pu, in compression 3=25602
- α -Pu, Young, 4.2-300°K, and mag. transition ~ 55°K 3=20691
- Si, electronic effect 3=18162
- SiC 3=18160
- SiO₂ glass, effect of fast-neutron irradi. 3=13330
- Sr formate, simple and dihydrate, u.s. meas. 3=23281
- Sr, shear const. temp. depend. 3=1216
- Sr(NO₃)₂ 3=18161
- SrTiO₃, rel. to phase transition and elec. field 3=5055
- SrTiO₃, from sound velocity meas. 3=13332

Elastic constants — contd

- Ta, 4.2°-300°K meas. 3=13325
- ThO₂ polycrystals, effect of porosity 3=13331
- Th₂O₃ of porosity, temp. depend. 3=23283
- Ti—B—Al alloys 3=11132
- TiO₂, rutile, meas. in k/cs range 3=6772
- Tl, hexagonal, 4.2-300°K range 3=11134
- UC, by pulse-echo technique 3=25599
- W, cast, effect of recryst. anneal 3=11183
- W, 4.2°-300°K meas. 3=13325
- W wire, shear modulus, temp. depend. 3=13329
- WC—Co(10%), anisotropy, from X-rays 3=6775
- Zn, calc. from first princs. 3=8395
- ZnO, single crystals 3=1213
- ZnS 3=8751
- ZnS, meas. and model 3=8556
- ZnS, wurtzite form 3=18159
- ZnSe, meas. and model 3=8556
- ZnSO₄·7H₂O, and crystal structure 3=20690
- ZnTe, meas. and model 3=8556
- 6061-T6 Al 3=17667

measurement

- anharmonicity, and u.s. distortion 3=17654
- brass, from shear-wave vels. 3=9527
- cubic crystals, from sound velocity meas. 3=13332
- crystals, by u.s. pulse method 3=20692
- films, supported, dynamic props. 3=23284
- limestones, in situ, techniques and results 3=9003
- polymers, dynamic moduli in mid-audio range, 4°-300°K 3=3211
- Pyrex, from shear-wave vels. 3=9527
- resonant freq., calc., improvements 3=25608
- rocks, dynamic props., u.s. method 3=3427
- rods, optical method 3=6776
- rupture modulus, in vacuum or inert atmos. 3=23361
- solid solutions, cubic, X-ray method 3=5054
- tensile testing apparatus, 5400°F, in vacuum 3=15974
- u.s. technique, pulse-echo method 3=21501
- from vibrations of cubes and prisms 3=18876
- Cr, results from diffuse X-ray and u.s. techniques 3=23285

Elastic deformation

- See also Bending; Stress/strain relations; Torsion.
- anisotropic bodies, due to dislocations 3=5063
- elasto-plasticity, non-linear boundary value problem 3=7154
- crystals, lattice vibr. spectrum changes, calc. 3=20078
- crystals, and paramag. reson. by spin—phonon interaction 3=18124
- electron diffraction pattern changes, for elongation 3=23527
- ferromagnetics, effect on magnetization curves 3=13247
- ferromagnetics, effect on mag. saturation process 3=8669
- irreversible processes, thermodynamics 3=3207
- isotropic motion of a medium, finite deform. 3=18883
- isotropic elastic medium with moving dislocations, deform. field 3=6785
- large, general theory 3=14072
- optical system alignment, ang., to 0.01" 3=21523
- parametric coupling to magnetization in ferrimagnets 3=13293-4
- from photoelastic effect 3=13320
- plane crack, stress distrib. 3=18216
- p—n junctions, rel. to resistance 3=10844
- rubber, shear and tension, theory and expt. 3=15972
- shells, nonlinear theory under Kirchhoff hypothesis 3=21270
- steel, Ni—Cr—Mo alloy, rel. to martensite transformation 3=3323
- steel, residual stresses in yield plateau region 3=20712
- textured polycrystals, thermal stresses 3=2736
- thin plates, energy of circ. dislocation loops 3=23274
- transparent solids, light deviation 3=23036
- Al, microdeformations, verification of linear elasticity theory 3=20684
- Be, ductility, in tension, 20-500°C 3=3220
- Cu₂O, effect on exciton absorption spectrum 3=3005
- Fe—Ni alloys, magnetization process, effect of uniaxial tension and compression 3=3102
- Ge, effect on anomalous X-ray transmission 3=20197
- Ge and Si, p—n junctions, rel. to resistance 3=17902
- LiF crystals, effect of surface charge 3=6773

Elastic deformation — contd

- Mb, crystal dislocations, var. stress 3=22772
- Mo, yield point return 3=23313
- NaCl with Ag⁺, Br⁻, K⁺ impurities 3=2791
- Ni films, rel. to anisotropic shape effects 3=15815
- NiZnCo ferrites, magnetization depend. 3=20614
- Si, over -196 to 1380°C range 3=5064
- V—Co—Fe alloys, effect on mag. props. 3=3115

Elastic fatigue

- alloys of low stacking-fault energy, hardening 3=20736
- β-brass, metastable, induced precipitation 3=1359
- carbon brush materials 3=20761
- crack nucleation, cross-slip models 3=20749
- crack propag. in sheets, theory 3=20744
- crystals, mechanisms, conference (Florida, 1962) 3=20734
- damage accumulation at high temps. 3=20745
- fatigue-curve parameter, estimation method, with limited number of specimens 3=20733
- f.c.c. metals, crack growth rel. to stacking fault energy 3=20743
- iron, fatigue limit of strain-aged material 3=8783
- Magnox AL 80 and ZR 80, at high temp. 3=25762
- metal tubes, apparatus with programme facilities 3=18188
- metals, effect of macrostresses 3=13345
- metals, fracture, low cycle, review 3=13376
- metals, microstructural damage, systematic 3=20735
- metals, at small amplitudes, structural changes 3=13337
- metals, theory from growing crack standpoint 3=20746
- metals, in torsion, structural mechanism 3=13335
- microplastic deformation processes 3=20699
- resonant cantilever beams 3=7261
- simulation of random stress effects by minimum number of discrete stress levels 3=5403
- steel (carbon), fatigue fracture surface electron microscope study 3=1244
- steel, fatigue limit of strain-aged material 3=8783
- steel, low-cycle behaviour, rel. to parameters 3=20753
- steel, mild, relation to mag. permeability and hysteresis 3=23301
- steel, rolling surfaces, water-accel., H, diffusion 3=25644
- Ag, slip processes correl. with hardening 3=20748
- Al alloy 24S-T, fatigue fracture 3=3244
- Al alloys, data from effects of humidity 3=20751
- Al alloys, low-cycle behaviour, rel. to parameters 3=20753
- Al alloys, microstructural changes 3=20741
- Al, constant-strain fatigue, substructure 3=11328
- Al, cyclic work harding, dislocations 3=20738
- Al, strain-cycled, hysteresis 3=20752
- Al, substructure under constant cyclic strain 3=20742
- Al, tension—compression, stress—strain relns. 3=11139
- Al, torsional, dislocation processes 3=25609
- Al—Cu alloys, effect of various treatments 3=25611
- Al—Cu alloy, disloc. pinning and unpinning 3=25610
- Cu, dislocation distrib. rel. to props. 3=20739
- Cu, fatigue failure under cyclic stress 3=1245
- Cu, fatigue fracture 3=3244
- Cu, fatigued, annealed, slip markings 3=2809
- Cu, torsional cycling, metallography 3=20747
- Cu, work hardening under cyclic straining 3=20737
- Cu—Zn alloys at 100°K, S—N diagrams meas. 3=20750
- Fe—C, strain ageing 3=3232
- Fe—Mn—C, strain ageing 3=3232
- Fe—N, strain ageing, electron transmission study 3=3232
- GaSb, dislocation-free, yield behaviour 3=23322
- Ge, dislocation-free, yield behaviour 3=23322
- InSb, dislocation-free, yield behaviour 3=23322
- Mg, oriented crystals, in shear 3=13338
- MgO, dynamic recovery and cross-slip 3=20749
- Si, dislocation-free, yield behaviour 3=23322
- Zn, dynamic recovery and cross-slip 3=20749
- Zn, slip processes correl. with hardening 3=20748

Elastic limit

- See also Slip.
- crystals and polycrystals, difference, theory 3=18175
- meas., for imperfect solids 3=8760
- metals, b.c.c., yield point, rel. to dislocation velocity 3=8788

Elastic limit — contd

- shells, local bulging instability 3=5394
- Mo, yield stress parameters det. 3=6702
- Cu—Al alloy, anisotropy 3=11143
- LiF whiskers 3=15981

Elastic losses

See Internal friction.

Elastic relaxation

See also Creep.

- measurement, automatic relaxometer for rubber 3=13339
- paraelastic centre, relaxation mechanism 3=23220
- paraffin crystals, α -dispersion 3=6781
- polyethylene, α -dispersion and mol. motion 3=6781
- polymers, thermodynamic consts. and activation parameters 3=6780
- polypropylene, rel. to n.m.r. line 3=3200
- rubber hydrochloride, cryst., stress relax. 3=1133
- temp. dependence of isothermal modulus 3=8755
- torsional vibrations, damping capacity back-ground 3=18171
- Au, aftereffect, activation energy and volume 3=11140
- Co, stress relax after plastic deform. 3=18172
- Cu, after plastic deformation at 4.2°K 3=8757
- Cu, damping capacity, neutron irradi. effects 3=5059
- Ge, vacancies, theory 3=22754
- Li ferrites, damping capacity, anomalies 4=5061
- Mg, stresses, dislocation processes 3=23310
- Ni, damping, effect of mag. field 3=11141
- Pb, overstressed microregions 3=11142
- Sn, overstressed microregions 3=11142
- Zn, nonelastic strain recovery 3=8776

Elastic waves

See also Acoustic waves; Seismic waves.

- Armco iron 3=9540
- attenuation decrements, rel. to propag velocities 3=14234
- bar, cylindrical, strain wave propag. 3=5484
- in bar and plate, mechanical input admittance 3=18923
- beryl, transversely isotropic half-space. 3=194
- compression, plane, in stratified medium 3=9537
- conical flow and Rayleigh scattering techniques 3=23966
- crystals, internal conical refraction 3=20098
- crystals, lattice energy current, theory 3=25186
- in crystals, quasi-transverse, theory 3=17655
- crystals, scatt. by edge dislocs. 3=17673
- crystals, u.s. distortion, and lattice anharmonicity 3=17654
- in cylindrical rod, resonant behaviour 3=14238
- in disk, prod. of microwave vibr. by ferromag. resonance 3=23958
- displacements in plane anisotropic medium, Lamb's problem soln. 3=1750
- dynamics of excited rigid strip mass on an elastic half space 3=18770
- earth, slowly rotating, surface waves. 3=195
- elasto-plastic, coupled with e.m. in dielectric semi-space 3=5824
- elastic sphere, torsional disturbances calc. 3=21475
- in ferromagnets, instability, rel. to applied r.f. mag. fld. 3=18096
- flexure waves, scatt. by inhomog. elastic plate 3=14235
- flexure waves, propag. in nonuniform rods 3=14236
- h.f. refraction, diffrn. in general media 3=9931
- half-space, due to axisymm. time-dependent forces 3=23967
- half-space, transversely isotropic. 3=194
- head waves, two-dim., in fluid or solid 3=23961
- impulsive, diffraction and scattering 3=23965
- in hollow cylinders, longitudinal modes 3=14242
- in homogeneous media, with plane paral. dividing boundaries, wave fields 3=16690
- ice, transversely isotropic half-space. 3=194
- inhomogeneous media, oblique propag. 3=5486
- initially homogeneous deformed bodies 3=11851
- interaction of 2 plane waves in isotropic solid 3=18888
- interface, pulse obs. 3=1416
- ion beam generation, in solids, pulse, for energy exchange and beam study 3=18889
- layer overlying half-space with sinusoidal interface, Rayleigh waves. 3=193
- liquid layer between elastic half spaces, e.f. 3=23960
- longitudinal, in earth's upper mantle 3=21026

Elastic waves — contd

- Love, dispersion inversion, Born approx. 3=5485
- magneto-, from cylindrical cavity, reson. amplification 3=18890
- magnetoelastic, conducting semi-space in a mag. field 3=16691
- metals, magneto-polarized, propag. and absorption 3=25606
- metals, propag., long. and transverse, ~ 1 Mc/s pulse frequency 3=18891
- parametric excitation in ferrimagnets 3=13293-4
- plane, intersecting, interact. in isotropic solid, nonlinear theory 3=7269
- plane longitud. in infinite plates, phase vel. 3=5483
- plastic waves, reflection from obstacle 3=23968
- in prestressed elastic solids, uniqueness 3=21471
- propag. along layers, two-dimensional, u.s. model 3=16686
- propagation, "anti-waveguide", in non-uniform layer, 3=18700
- propagation, developments, conference 3=11675
- propagation in infinite piezoelectric plate 3=9538
- propag., transversely inhomogeneous medium 3=16685
- quartz, rel. to current oscillations, during Ag⁺ and Cu⁺ conduction 3=25412
- radiation beam generation, in solids, for energy exchange and beam study 3=18889
- Rayleigh, in a dielectric in a mag. field 3=19435
- Rayleigh, from fault of arbitrary dip, radiation pattern 3=16687
- Rayleigh, interface of two anisotropic media 3=7268
- reflected, in media with velocity differentiation 3=21474
- reflection and refraction at boundary between 2 plates 3=14237
- reflection and rarefaction at solid-liquid boundaries 3=9541
- in relativistic thermodynamics, velocity 3=7094
- rocks, absorption meas. procedure 3=3429
- rocks, attenuation consts. rel. to freq. 3=3428
- rods and plates, transient propagation 3=21472
- rubber filaments, finite wave propag. 3=7270
- SH interference wave propag., elastic spherical layer 3=18886
- SH, in semi-infinite region below crust 3=23963
- SH, in wedge-shaped medium, line source 3=23962
- scattering by irregular surfaces 3=3845
- scattering, plane waves, by spherical obstacle 3=9542
- shear, reflection from interface of 2 anisotropic media 3=21473
- shear waves in viscoelastic material 3=11852
- shear-wave vel. meas. 3=9527
- solid, scattering by cavity ribbon 3=1746
- in solid solutions, with solute particles or cavities, attenuation 3=2727
- solids, anelastic, review 3=21477
- spherical layers, SH interference waves 3=14239
- in sphere, mechanical impulse excitatn. 3=1747
- steel, elastoplastic, prod. by explosion 3=18885
- stress waves in bars, reflection and transmission 3=23964
- surface, atten. in layer on half-space 3=14240
- thermoelastic transmission across boundary 3=7156
- torque pulse propag. in layered elastic media 3=11850
- unloading waves theory 3=18887
- u.s., in spiral wires, wavelength \gg transverse dimensions, velo. 3=21499
- velocities, from refl. and refr. times 3=14241
- velocity, medium with cylindrical ducts 3=18884
- in wire, longitudinal, effect of surrounding fluids 3=9539
- in $\text{Ca}_x\text{Ba}_{1-x}\text{TiO}_3$, dilatational, vels. 3=20122
- Cu—Au, u.s. velo., wedge method, and consts 3=23276
- Cu—Ag, u.s., velo., wedge method, and consts. 3=23276
- Cu—Ni, u.s. velo., wedge method, and consts. 3=23276
- Cu—Pb, u.s. velo., wedge method, and consts 3=23276
- Fe, elastoplastic, prod. by explosion 3=18885
- Ge, attenuation rel. to doping 3=4811

Elasticity

See also Compressibility; Mechanical strength; Stresses, internal; Thermoelasticity; Viscoelasticity.
 alloys, second-order, rel. to Vegard's law 3=3319
 anelasticity, rel. to internal friction 3=18170

Elasticity — contd

- anisotropic, effect on dislocation stress fields 3=10661
- anisotropic media, plane theory 3=1750
- anisotropic and nonhomog., variational princs. 3=1210
- appl. of vectors, tensors and differential geometry 3=15969
- Armco iron, elastic-plastic props. 3=9540
- BaTiO₃, elastic energy rel. to phase transition 3=6816
- BeO, hot pressed, elastic anisotropy rel. to texture 3=25648
- consolidating medium with spherical cavity 3=91
- of crystalline media, metallic crystals of cubic symmetry 3=13322
- crystals, lattice theory 3=13319
- cylindrical shell of variable thickness, bending 3=89
- deformation of a non-homogeneous hollow spherical shell subjected to normal inner and outer tractions 3=14075
- diatomic media or with atoms with intrinsic spin 3=7139
- dislocations, angular, stress field 3=22771
- displacement boundary value problem of electrostatics 3=14080
- dynamic theory, anisotropic media 3=21274
- elastic domains development in solids 3=13367
- elastic tensor of given symmetry nearest an anisotropic elastic tensor 3=23812
- α -Fe₂O₃, magnetoelasticity 3=25523
- general theory, non-linearized 3=8748
- glass, anelasticity, exptl. review 3=13334
- glass, review 3=6770
- Green's function for anisotropic medium 3=7161
- impact of rigid circular cylinder on elastic solid 3=94
- in general relativity 3=7102
- integral equation methods 3=23733
- integral equation methods 3=16561
- internal buckling under initial strain 3=14077
- interfacial instability under initial stress 3=14079
- isotropic, strain energy functions 3=11736
- Lamé homogeneous displacement equation, solution 3=23815
- large deformations, general theory 3=14072
- magnetic materials, elastic resonant frequency, meas. meth. 3=16572
- metals, dislocation stresses 3=2801
- metals, quadratic theory rel. to electron density 3=5053
- minimum energy theorem and inclusion problem 3=790
- multiphase materials, variational princs. 3=11735
- nonlinear theory, variational theorem 3=3221
- O₂-radical, substituting for halogen ion paraelastic centre relaxation mechanism 3=1219
- and piezoelectricity, crystals, tensor symmetry 3=17948
- plates, linear algebra and analysis application 3=9381
- polycrystals, theory, linear approx. 3=20684
- polycrystals, upper and lower bounds, theory 3=1211
- principle of minimum complementary energy 3=92
- rotating shells of revolution, supported on an elastic body 3=9387
- shells, nonlinear theory under Kirchhoff hypothesis 3=21270
- shells, thin, boundary-layer eqns. in linear theory 3=88
- stability, for n generalized coords., theory 3=7155
- stiffness, effect of internal stresses 3=7157
- surface instability under initial stress 3=14078
- thermodynamic theory 3=1658
- thin plates, energy of circ. dislocation loops 3=23274
- two-dimensions, and arbitrary curvilinear coords, theory 3=86
- vibrating plates, circular, non-linear vibr. 3=18872

Liquids

See also Compressibility, liquids.

- elastico-viscous parameters meas. by rotating sphere 3=23840
- polymers 3=21351

Elastoplasticity

See Plasticity.

Electrets

See also Electrostatics.

- anthracene, photodepolarization, nonlinear 3=20399

Electrets — contd

- Carnauba wax, formation and discharge in nuclear radiation fields 3=13126
- paraffin wax, prep. and props. 3=8566
- persistent internal polarization produced by ionizing radiation 3=17947
- photoelectrets, electrophotographic process 3=15622
- rubber, on vulcanization, time var. for different fields 3=25409
- shellac wax, prep. and props. 3=25410
- AgCl, photoelectret state 3=2964
- AgCl, photoelectret state formation 3=15623
- HgI₂, photoelectret state 3=2963
- S, photo, polarization in darkness, initial elec. field effects 3=25411
- Se films containing S, photo, depolarization 3=23005
- Se, photodepolarization, nonlinear, and carrier parameters 3=20417
- SrTiO₃, lattice distortions after electrification 3=10652
- Ti complex ceramics, practical use 3=6622

Electric breakdown

See Breakdown, electric.

Electric charge

See also Space charge.

- double layer, potl. and elec. field distrib. 3=1392
- dust from β -irrad. KCl monocryst. 3=902
- electrification by rubbing ice on ice 3=19158
- frictional charging, in air currents, kinetics 3=21688
- inertial origin, rel. to compensated electron model 3=1584
- semiconductors, surface effects 3=13049
- storage device, semiconductor surface state 3=8540
- surface, effect on deformation, LiF crystals 3=6773
- surface, suspensions, colloidal, lamellar 3=11364
- on thermoplastic films, wrinkling deformation 3=23493
- van de Graaff belt, meas. 3=19384
- van de Graaff generators, transfer to, theory 3=19383
- NaCl, flow prod. by plastic deformation 3=900
- on NaCl, generation during plastic deform. 3=23320

Electric fields

See also Electromagnetic fields.

- conducting half-space 3=21690
- cone, infinite, on either side, uniform charge 3=16896
- of discharge, electron-beam probe meas. 3=24154
- disk electrode in borehole 3=24203
- electron plasma, fluctuations, turbulent 3=24310
- in electron plasma, periodic distrib. 3=21873
- "form factor", depend. on Biot boundary condition 3=21207
- ionized, equation, regular solutions and boundary conditions 3=19168
- ionized, equations, singular and regular solutions 3=9772
- ionospheric, intensity on rocket surface 3=3487
- Lichtenberg figures, use of colour negative film 3=5597
- liquids, distrib., pressure analysis 3=9479
- meas., surface microfields, electron-optical method 3=3373
- Penning discharge, radial field, Stark effect meas. 3=21730
- plasma, between two electrodes, on excitation to high speeds and turbulence 3=9767
- plasma microfield, distrib. functions 3=5660
- plasma, singularities 3=4110
- plasma, space charge sheath 3=12113
- satellites, artificial, nearby 3=21137
- semiconductors, var. with electron conc., large impulse currents 3=22919
- solids, nonmetallic, charged defects 3=12958
- spherical capacitor, exact solution 3=19160

effects

- n -amyl acetate, viscosity, time changes 3=18808
- boiling point, liquids, none up to 30 kV/cm 3=16839
- crystallization, nucleation centres 3=18246
- crystals, e.s.r. 3=20639
- crystals, growth, impurity distrib. 3=18245
- crystals, rel. to n.q.r., tensors 3=3206
- nonmetals, light absorption 3=4967
- on dielec. const. of anisaldazine liquid crystal 3=11803
- diffusion in W(15 at.%)—Mo, of W and Mo 3=20237
- on drops, falling 3=7417
- electric discharge, h.f., inhomog. a.c. field 3=24227

Electric fields — contd**effects — contd**

- electron in periodic lattice, approx. calc. 3=2751
 field desorption, theory 3=13570
 on flames, increased laminar stability 3=7373
 gas, light scatt., in inhomogeneous field, intensity eqn. 3=23931
 hydrogen molec. ion dissociation 3=7436
 ice whiskers growth from supercooled cloud 3=5089
 inert gases, luminescence, due to ionizing radiation, increase 3=16664
 ion emission, review 3=19371
 isotope separation, recoil products of $\text{Br}(n,\gamma)$ and $\text{I}(n,\gamma)$ 3=8110
 luminescence, gases, due to ionizing radiation, increase 3=16664
 luminescence, ZnS:Mn , ZnCdS:Mn , by X-rays, a.c. components prod. by 10^4V/cm at 400 c/s 3=15710
 macromolecular solns., orientation in shear flow and elec. field 3=16617
 masers, optical, ruby 3=19485
 metals, electromigration 3=22829
 n.m.r. of molecules in fluid 3=6419
 nuclear decay, ang. correl., quadrupole interact. 3=8025
 nucleation in superheated liquid by elec. field 3=14420
 paramagnetic reson. and relax., Fe group ions 3=18126
 perylene, luminescence, dispersed in n-heptane, polarization, 77°K 3=18043
 plasma, electroacoustic waves, quasisteady approach 3=24320
 plasma, kinetic eqn. in weak static field 3=5664
 plasma oscillations, 2-component plasma 3=21826
 on polar liq. dielectrics, movement 3=3812
 pulse discharge, 10 000 Mc/s, formation and arcing 3=19215
 quartz, elastic const. change tensor, from reson. freq. changes 3=23009
 α -quartz, Raman lines 3=18009
 ruby, Al^{27} n.m.r., elec. induced 3=15962
 semiconductors, absorption, by conduction electrons 3=20459
 scattering, light, polar molecule meas. possibility 3=24059
 solutions, internal field, effect on solute spectra 3=21373
 Ba desorption from W 3=3360
 Cr ions, paramagnetic reson. and relax. 3=18126
 $(\text{Cr}_2\text{O}_3)_{0.8}(\text{Al}_2\text{O}_3)_{0.2}$, magnetization induced by elec. field 3=15740
 Cr_2O_3 , magnetization induced by elec. field 3=15739
 Cr_2O_3 , magnetization induced by elec. field 3=15740
 Cs desorption from W 3=3361
 GaAs, n.m.r. of $\text{Ga}^{69,71}$, linear Stark effect 3=8735
 Ge, photoconductivity, quenching, 1.8–2.5 μ , freq. depend. 3=17959
 Ge, photon emission 3=855
 H^+ ions, mean life against dissociation 3=12083
 Kr, luminescence, X-ray excited, increase 3=16664
 Mn ions, paramagnetic reson. and relax. 3=18126
 PbZrO_3 , ferroelec. props. 3=13118
 S, photoelectret polarization in darkness, initial 3=25411
 Sb diffusion, in Al 3=22830
 SbSI, absorption edge shift 3=20468
 Si, p–n junction, excess reserve currents 3=22960
 Xe, luminescence, X-ray excited, increase 3=16664
 ZnCdS:Mn , luminescence, by X-rays a.c. components prod. by 10^4V/cm at 400 c/s 3=15710
 ZnCdS:Mn , luminesc., prior sensitization 3=10994
 ZnS , α -particle scintill. quenching 3=13208
 ZnS , luminescence due to γ -rays 3=8629
 ZnS:Mn , luminescence, by X-rays a.c. components prod. by 10^4V/cm at 400 c/s 3=15710
 ZnS phosphors, cathodolumin. 3=3065

Electric strength

- See also Breakdown, electric.
 alkathene 7, var. with thickness 3=13125
 gases, Ar–Ne mixtures, for pulsed microwave field 3=5647
 n-hexane, effect of static elec. field and electrode surface layers 3=14180
 polythene, var. with thickness 3=13125
 rocksalt, anisotropy 3=6621
 solids, in elec. discharge, ambient medium effect 3=17946

Electric strength — contd

- spark gap, with repeating discharge, recovery rate 3=21743
 BaTiO_3 , Au and Al electrodes 3=2962
 BaTiO_3 , temp. depend. of breakdown field 3=4948
 BaTiO_3 , temp. variation 3=15619
 Ne–(0.01–0.3 %)Ar, ignition and burning voltages 3=19221
- Electrical measurement**
 Entries describing measurement methods for specific electrical quantities and effects may also be found listed under the various headings for the subjects concerned.
 a.c. bridge balance indicator, phase selective 3=9695
 aerial prospecting, effect of surrounding medium 3=3425
 ballistic galvanometer to meas. long-period impulses 3=24163
 capacitance-coaxial circ. loops 3=19159
 capacitance of double layer of Hg dropping electrode, bridge cct. 3=14476
 circuits to meas. elec. cond. of sea-water 3=14486
 characteristic electron-energy losses in metal films 3=5712
 conductivity type, at liq. He temp. 3=16883
 conference, precision e.m. meas., Boulder (1962) 3=12309
 correlator of photoelec. fluctuations, for laser-beam analysis 3=9596
 discharge elec. fields, by electron beam probe method 3=24154
 semiconducting diode, tunnel 3=22964
 electromagnetic, precision, conference, Boulder, Aug. 1962 3=9689
 electrometer, a.c. biased 3=21681
 electrometer voltmeter, transistorized 3=12045
 electron-density profiles in plasma, mm-wave method 3=19229
 electrostatic analyser for electron energy spectra, recording system 3=2039
 e.m.f., NBS standard volt box 3=14472
 epitaxial layer impurity profile determ. by microwave-diode meths. 3=25273
 formative time lags in hydrogen discharge 3=9736
 GaAs, carrier concentration meas. 3=17878
 gas stream conductivity 3=24156
 goniometer, capacitative, for Faraday rot. meas., v.h.f. range 3=19440
 Hall mobility, by Corbino disk method 3=9691
 high voltage pulse meas. 3=12044
 magnetoresistance of ferromag. films, rotating mag. field technique 3=14470
 measuring resistors, phase error or a.c. correction 3=350
 metal bar resistivity, by eddy current decay 3=12040
 metal migration in elec. contacts 3=9690
 microwave power techniques 3=12042
 mm. wave microcalorimeter 3=12043
 ohmmeter, linear, 10^{-2} – $2 \times 10^9 \Omega$ 3=16884
 permittivity, r.f. substitution bridge circuit 3=14477
 phasemeter, up to 4.5 Mc/s, transistorized 3=16886
 photoelectromagnetic effect meas., apparatus 3=7411
 plasma diagnostics, mm-wave method 3=19230
 potentiometer and shunt improvements 3=14474
 potentiometer recorder, range changing switch, automatic 3=21680
 power-station flue dust, apparatus 3=9693
 pulses, picosecond, by self-sampling 3=5612
 semiconductor carrier lifetime, by microwaves, high cond. 3=20296
 semiconductor diodes, varactors, Q 3=19303
 semiconductor, majority, carrier sign determ., by hot-point probe 3=8498
 semiconductor surface props., in waveguides 3=19454
 semiconductors, contactless method 3=15566
 semiconductors, homogeneity anal. method 3=15567
 solion electrochemical diode 3=16887
 spectrum analyser, 10^{-8} –30 c/s, for nuclear reactors 3=24161
 surface resistance, four-electrode system 3=9692
 thermocouple potentiometer 3=14475
 units, various systems 3=1905
 voltage by Stark effect 3=12041
 voltage, high, pulse, by capacitive voltage divider 3=5599

Electrical measurement — contd

- voltage at point on periodic waveform 3=24153
- voltage, in presence of strong fields 3=21672
- voltage signal rel. to high pressures, device 3=23831
- voltmeter, electrostatic, surface potl., meas. 3=7419
- voltmeter, high-impedance, solid state 3=14473
- voltmeters, digital, use of impedance converter 3=9702

Electrical units

See Units.

Electricity

- a.c. current origin through oscillating electron-hole plasma 3=850
- battery Pb-acid storage, 110V, 170 Ahr, apparent solar control 3=1927
- book 3=5596
- British supply industry, magnetic steel demand 3=17015
- capacitor bank, 384 kJ, spark-gap switching 3=3972
- "electronics", definition 3=24152
- geophysical prospecting, electrical, theory 3=3436
- heat-elec. energy converter, thermionic 3=9713
- interfacial phenomena, a.c. methods 3=12065
- metallic layers, props., conference, Liège (1961) 3=13029
- nuclear reactor, Indian Point 3=25015
- power generation by water reactors, symposium 3=10402
- sodium/tin liquid-metal cell 3=1926
- standard-voltage cells, oil baths 3=19055
- syllabus for first-year physics 3=12038
- thermal converters for the l.f. a.c. meas. 3=345
- voltage, high-frequency, standard; by bolometer and thermistor bridge 3=344

direct conversion

- Carnot engine with thermally ionized gas as working fluid, energy obtainable 3=5558
- converters with Cs space charge compensation, two types 3=9714
- Cs vapour diode 3=14628
- Cs vapour diode, efficiency analysis 3=3999
- Cs vapour thermionic converter, current oscillations 3=24207
- direct conversion, using galvano-thermomagnetic effects 3=356-7
- fuel cells, principles 3=19164
- galvano-thermomagnetic devices 3=9716
- gas diode, potential distrib., rel. to ion reflection 3=14509
- ionization energy conversion, device using X-rays 3=5617
- magnetothermal devices, bound to figure of merit 3=358
- magnetohydrodynamic generator, insulating duct walls 3=5832
- magnetohydrodynamic generators, basic eqns. 3=7692
- magnetohydrodynamic generators, theory 3=4001
- magnetohydrodynamic power generation, a.c. 3=7693
- magnetohydrodynamic power generation, review 3=5833
- MHD generator, a.c. induction type 3=9925
- m.h.d. generator, electron heating in Hall fields 3=24459
- m.h.d. generator, elevation of electron temp. 3=24460
- m.h.d. generator, plasma conductor in forced convection 3=21777
- m.h.d. generator, stability 3=24272
- m.h.d. generators, temp. instability 3=9918
- MHD power generator, end losses calc. 3=9924
- m.h.d. travelling-wave devices 3=21967
- Nernst refrigerators for anisotropic materials, operating characteristics 3=12064
- photovoltaic solar energy converters, efficiency 3=15637
- plasma converter, performance characteristics 3=7423
- plasma diode, kinetic theory for low plasma density 3=14511
- plasma as medium, theory 3=24271
- plasma physics, appl. 3=5618
- from radioactive isotopes 3=5616
- radionuclide generators 3=12063
- Si solar cells, effect of proton irradi. 100, 500 keV 3=14508
- thermal/electrical/mechanical energy 3=9717
- of thermal energy by m.g.d. generator 3=14759
- thermionic converter, auxiliary discharge, characteristics 3=7422
- thermionic converter, effect of interelectrode plasma 3=24206

Electricity — contd

direct conversion — contd

- thermionic convertor, gas filled, as a.c. generator, 1000 c/s 3=3997
- thermionic convertor, oscillations 3=3995
- thermionic, with electron accel. 3=19165
- thermionic, l.p., pot. and conc. distrib. 3=24208
- thermionic converter, plasma resistance 3=4155
- thermionic generator with ion injection 3=7421
- thermionic, use of ThC 3=4000
- thermoelectric converter, effect of space charge 3=9718
- thermoelectric generator, using close W or Th-W electrodes in vacuo 3=14512
- thermoelectric generators, efficiency calc. 3=14510
- thermomag. generators, efficiency 3=9715
- using ordering, partial, of random thermal motion of electrons in non-uniform mag. field 3=19165
- vapour, ionized, jet, positive and negative charge separation 3=3996

Electrochemistry

- See also Chemical analysis, electrochemical; Electrolysis; Electrolytic deposition.
- adsorption of neutral subst. at metal-electrolyte surface 3=6889
- adsorption reactions, appl. of Gibbs adsorption eqn. 3=5168
- basic concepts in teaching 3=341
- binary electrolyte, Faraday impedance, irreversibility effect 3=16174
- charged particle transport in elec. neutral solns. 3=5167
- double layer, ionic charge components, calc., reversible systems 3=18454
- double layer, potl. and elec. field distrib. 3=1392
- EI-437A alloy, precipitation 3=8913
- electro-erosion of metals, process dynamics 3=23488
- electro-erosion, of metals, liquid and vapour phases of products 3=20914
- electrolytes, strong, Debye-Huckel limiting law 3=16167
- electrolytes, strong, thermodynamic theory 3=8966
- electropolishing technique for Ge and Si 3=23501
- equation of state, electrolyte, two-dimensional 3=18452
- exchanges, cationic, organic solvents, use of 3=18453
- free energy of nonequilibrium polarization systems 3=16169
- fused electrolytes, study by oscillopolarography 3=16173
- liquid-junction potential redox meas. 3=23546
- metals, soln. in NH₃, e.s.r., effect of adding electrolyte, 3=11811
- molecular complex form., organic, by electron transfer 3=21003
- pH titration apparatus, automatic 3=8941
- polyelectrolyte solns., interaction of neighbouring charged groups 3=21345
- polyelectrolyte solns., volume effect theory 3=21346
- "potentiostatic pulse" method, ohmic fall compensation 3=8969
- semiconductors, electron chemical potential 3=2873
- semiconductor, with two electrolyte contacts 3=18446
- sodium/tin liquid-metal cell 3=1926
- solion diode 3=16887
- test for distinguishing between W, Mo and NiCoFe 3=9311
- tetra-n-butyl ammonium iodide in CCl₄, contact ion pairs, rel. to added methanol 3=13612
- transport phenomena, on irreversible-process theory 3=18757
- AgBr crystals, defect electron transport rel. to Br partial pressure 3=6487
- AgBr precipitates, adsorption of H⁺ and OH⁻ ions 3=5165
- Al polishing, growth of oxide spirals 3=1261
- Cd, activity with respect to Tl 3=23548
- Cs, soln. in NH₃, e.s.r., effect of adding CsI 3=11811
- Ge in contact with aqueous solution, potential distrib. across low-index crystal planes 3=10788
- Ge-electrolyte interface, surface states 3=10780
- Ge-NaOH solution interface, surface conductance 3=10781
- K, soln. in NH₃, e.s.r., effect of adding KI 3=11811
- Na, soln. in NH₃, e.s.r., effect of adding NaI 3=11811
- PbCl₂-KCl melt, double layer, capacity 3=3400
- Si-KOH boundary 3=6923
- electrodes
 - amalgam, equil. pot. 3=25832
 - anodic oxidation, ion transport mechanism 3=13616

Electrochemistry — contd**electrodes — contd**

- "Armco" iron, radioactive, potentials 3=16175
 composite electrode, mixed and local potl. 3=13609
 double layer, charged interface structure 3=21002
 gas electrode, impedance 3=16166
 glass, cation sensitivity 3=3401
 ideally polarizable, rectification effect 3=16179
 kinetics, symmetry factor theory 3=13607
 luminescence, Al, near anode and cathode, flash spectra 3=10984
 metal migration 3=9690
 multiple, kinetics of stationary state 3=18447
 polarization, sinusoidal, appl. of Lagrange's theorem 3=5169
 porous, current distrib. analysis 3=13614
 steel-2, radioactive, potentials 3=16175
 Al_2O_3 formation, u.v. luminesc. 3=8615
 $CaCO_3$ (calcite), potential rel. to calomel 3=8968
 $Cd/Cd^{2+}/Cd-Bi$ e.m.f. 3=23548
 Cu, single crystals, potential, in H_2O , NaCl solns., effect of illum. 3=18451
 Fe, anodic activation 3=13611
 Ge cathode in 2 mol HCl electrolyte, surface states 3=17689
 Ge-electrolyte interface, impedance, frequ. depend. 3=18445
 Ge, p-type effect of surface states on elec. props. 3=21001
 Ge, surface state, during anodic dissolution 3=16177
 Ge, surface recomb. rate, potential depend. 3=20304
 Hg, adsorption at interface 3=1380
 Hg, dropping, double-layer capacitance meas. 3=14476
 Hg dropping, mechanical props. 3=1393
 $Na_2O-Al_2O_3-SiO_2$ glass, electrodes cation sensitivity and durability meas. 3=3401
 $Na_2O-B_2O_3-SiO_2$ glass, electrodes cation sensitivity 3=3401
 Pb electrode, smooth, capacitance 3=16178
 Pd-H soln. in constant current, anodic oxiation 3=5166
 Pt, in KNO_3 , $KNO_3 + NaNO_3$, double electrical layer, impedance 3=16168
 Si and Ge, impedance by electrolyte interface 3=18444
 Si, n-type, effect of surface states on elec. props. 3=21001
 Tl amalgam, drop electrode, adsorpt., elec. reduction of anions 3=11349
 $Tl/Tl^+/Tl-Bi$ e.m.f., oxidation effects 3=23548
 $Tl/Tl^+/Tl-Sb$ e.m.f., oxidation effects 3=23548

Electro-deposition

See Electrolytic deposition.

Electrodes

See Cathodes; Electrochemistry, electrodes.

Electrodynamics

See also Eddy-currents; Quantum electrodynamics.

- Bloch's transport eqn., quantum theory 3=9366
 charge moving in magnetoplasma, radiation from 3=24270
 charge moving in medium, elec. field 3=21936
 charge moving in vacuum over plasma, energy loss 3=14746
 charge-particle collisions in mag. field 3=4253
 charged particle in dipole mag. field, theorems 3=473
 charged particle in helical mag. field 3=21940
 charged particle motion in mag. mirror systems 3=24435
 charged particle motion in uniform mag. fld. increasing linearly with time 3=2092
 charged particle motion in varying mag. field 3=4252
 charged particles, in e.m. wave, autoresonance 3=7691
 Cherenkov radiation in dielec. tube, theory 3=24440
 classical, radiation damping and boundary conditions 3=5819
 classical spinning particle, macroscopic motion 3=2094
 cosmology, direction in time of neutrino travel 3=3534
 current-carrying conductor, motion in conducting chamber 3=19421
 $CuSO_4$, electromagnetophoresis 3=16901
 cylindrical conductor in axial motion 3=14743
 dielectric friction of rotating dipole 3=12295
 dielectric friction on a moving ion 3=12294
 dispersive medium, review 3=17033
 dispersion relations, electrostatic analogy 3=19419

Electrodynamics — contd

- e.m. fields, two moving media, boundary conditions 3=2093
 e.m. levitation calcs. for axially-symmetric systems 3=24434
 e.m. scattering into half original wavelength 3=24437
 electromagnetophoresis, $CuSO_4$, petrol, vaseline, ink 3=16901
 electron beams, interaction with periodic elec. and mag. fields 3=12243
 electron diffusion, in scattering gas 3=5820
 electron field mass 3=21944
 electron gravitational motion, geodesic departure, drag energy loss 3=18708
 Faraday motor, demonstration apparatus 3=3703
 fluid-fluid interface, electrohydrodynamic surface waves 3=475
 forces due to currents in magnetized material 3=24433
 He, superfluid, in narrow channels, elec. field effects 3=312
 injection of high-velocity particles into strong mag. fields 3=14653
 ink, electromagnetophoresis, and chemical analysis 3=16901
 light scattering by free electrons, harmonics predicted 3=232
 magnetic dipole, moving, e.m. radiation 3=4250
 magnetic mirror effect, demonstration 3=4194
 magnetoelastic waves, from cylindrical cavity, reson. amplification 3=18890
 magnetoelectric media, tensor relns. and wave propag. 3=2855
 magnetothermoelasticity, general two-dimensional problem 3=18762
 magnetostatic energy, macroscopic, microscopic basis 3=2089
 motion of charged particle in polarized e.m. fields 3=21942
 nonlinear media 2nd and 3rd order elec. cond. tensors 3=7682
 nonlinear, structure of singularities 3=24439
 particle acceln. by e.m. waves in magnetic field 3=2091
 particle motion in plane e.m. wave, resonance effects 3=21943
 particle motion, plasma, magneto-active, effect of e.m. radiation 3=16946
 particle vibration damping in periodic field 3=9911
 petrol, electromagnetophoresis 3=16901
 phase waves, concept 3=23746
 plasma fluctuations in non-steady state 3=4172
 plasma, linear 3=21769
 plasma, magnetized, current-carrying, energy conversion mechanism 3=7527
 plasma, quantum, in uniform mag. field 3=4129
 plasma, turbulent 3=16932
 radiation reaction, classical theories, review 3=17163
 regularized models 3=4317
 relativistic charged particle, equation of motion and radiation damping 3=14744
 relativistic charged particle, motion, one-dimensional 3=14745
 relativistic charges, effect on streamline and induction 3=19418
 relativistic motion in external radiation field 3=24438
 relativistic spinning electron, quasi-classical theory 3=1585
 relativistic, tetrad orientability 3=21227
 resonance acceleration of particle in modulated mag. field, theory 3=474
 rotating particle with mag. moment, eqns. of motion 3=425
 shock wave excitation procedure 3=1757
 shock waves, m.h.d., Fermi acceleration 3=9910
 stress tensor, asymmetric, continuous medium, mechanical and e.m. fields 3=19420
 trapped charged particle, Foucault pendulum behaviour 3=14742
 two-body problem, one-dim. analysis 3=7680
 vaseline, electromagnetophoresis 3=16901
 Vavilov-Cherenkov, radiation in isotropic optically active medium 3=19607
 waveguide partially filled with dielec., Cherenkov loss 3=7683

Electrokinetic effects

- See also Electrophoresis.
 colloids, electrokinetic potl. 3=3417
 ion drag pumping, dielec. liquids 3=11778-9
 n-amyl acetate, viscosity, time changes 3=18808
 streaming potential in small capillaries 3=14179
 streaming potentials at very high differential pressures 3=16596
 ξ -potential calc. from mobility meas. 3=6921
 Co, diffusion of W, by electric current, 1100
 1350°C 3=17782

Electroluminescence

- alkali halides, excitation technique in films 3=11006
 anthracene crystals, 10-20 μ thick 3=18051
 carborundum, black, type III emission 3=3071
 cells, light intensity decay meas. 3=4993
 crystal phosphors, rel. to bond-type 3=15718
 diamonds, type I and IIa 3=964
 effect of phosphor-embedding medium on efficiency 3=967
 energy absorption in sinusoidal voltage 3=8630
 field decay of local centres, theory 3=15453
 injection, tunnel, junctions, large preparation 3=23121
 organic, specimen preparation and meas. 3=965
 phosphors, pulse excitation 3=18047
 Al₂O₃-AlN systems 3=10985
 CdS, spectral distrib., annealing effects 3=11262
 CdS, spectrum, comparison with photoluminescence 3=8632
 CdS, d.c., meas. and excitation mech. 3=11007
 CdS, injection, 1.3V 3=15719
 CdS, review 3=13220
 CdS, single crystals 3=13219
 CdS-Cu₂S, diodes 3=25382
 CsI:TI, film, 1 μ m 3=20541
 CsI:TI, sublimated layer 3=11006
 GaAs diodes, recombination radiation, depend. on current 3=13091
 GaAs, injection, polarization 3=23120
 GaAs junction diodes, line narrowing of emitted radiation 3=15601
 GaAs p-n junction, forward biased, stimulated emission 77°K 3=7735
 GaAs, recombination radiation 3=10853
 GaAs_xP_{1-x} 3=11008
 Ga(As_{1-x}P_x) junctions, forward biased, coherent emission, 77°K 3=7734
 GaAs diodes, maser, mag. fields, shift, 90 kG 3=20542
 GaAs p-n junctions and tunnelling 3=20543
 GaAs, recombination excitation, by maser 3=20538
 GaAs_{1-x}P_x semiconducting p-n junctions, temp. var. 3=25377
 GaAs, spontaneous and stimulated, pressure effects 3=25495
 GaP, carrier injection 3=3067
 GaP, devices using carrier injection 3=13221
 GaSb p-n junction, injection effect 3=15721
 Ge, radiative carrier recombination at dislocations 3=17860
 Ge, recombination excitation, by maser 3=20538
 Ge recombination shift on pulse current injection, in diode 3=20539
 InSb, semiconducting tunnel diodes, recombination 3=23122
 MgO, cathodes, cold, var. with current and temp. 3=20544
 Si, recombination excitation, by maser 3=20538
 Si, recombination radiation, decay, meas. 3=20540
 SiC, α and β -phase, n-type region 3=6684
 (Zn,Cd)(S,Se) phosphors, red-emitting 3=13217
 ZnCdS-Mn, enhancement by electric field, u.v. excitation 3=6673
 ZnO, rel. to electron excitation mech. 3=18048
 ZnS:Cu:Pb 3=20545
 ZnS, delayed recomb. 3=8631
 ZnS, dielec. study, emission mechanism 3=2947
 ZnS, effect of crystal size 3=20537
 ZnS, excitation mechanisms 3=4992
 ZnS, four aspects 3=23124
 ZnS, frequ. factor and trap depth det. 3=23125
 ZnS, trap filling by field excitation 3=23126
 ZnS, with different activators, brightness waves 3=11015
 ZnS films, d.c. effect 3=5720

Electroluminescence — contd

- ZnS grains, rel. to voltage phase angle 3=3068
 ZnS, Gudden-Pohl flashes 3=18050
 ZnS, model 3=13208
 ZnS phosphors, excited by square pulses 3=15722
 ZnS, photoelectroluminesc., a.c. and d.c. 3=3070
 ZnS powders, microscopic exam. 3=11012
 ZnS, single crystals, due to Cu migration 3=13216
 ZnS, 4f-4f transitions of rare earths 3=25496
 ZnS, review 3=13220
 ZnS 3=966
 ZnS, Cu activated, a.c., pulsed 3=18046
 ZnS:Cu, avalanche processes 3=11014
 ZnS:Cu, avalanche processes 3=18049
 ZnS:Cu, microscopic observations 3=11016
 ZnS:Cu phosphors 3=11010
 ZnS:Cu, photodielec. effect 3=15614
 ZnS:Cu rel. to Cu diffusion temp 460° to 900°C 3=15723
 ZnS:Cu 3=20345
 ZnS:Cu, Al luminor, rel. to thermoluminescent light sum meas. 3=3074
 ZnS:Cu:Al, spectra of single crystals 3=6683
 ZnS:Cu, Cl, crystal structure and stacking faults 3=23123
 ZnS:Cu, Cl, temp. depend. meas. 3=11013
 ZnS:Cu(Cl,Br,I), pulse excitation 3=11009
 ZnSe, p-n junctions 3=11011
 Zn(S:Se):Cu phosphors, voltage depend. 3=13218

Electrolysis

- See also Conductivity, electrical, electrolytic; Dissociation, electrolytic; Electrochemistry; Electrolytic deposition; Ion velocity, electrolytic.
 alkali halide crystals and conductivity, electrical, var. 3=20380
 alloys, binary, anodic polariz. curves 3=11350
 cell potential field "form factor", depend. on Biot boundary condition 3=21207
 cellulose, dry 3=20377
 cutting and shaping metal specimens 3=11649
 electrical transport, temp. gradient present 3=25829
 ion separation in aq. soln., continuous 3=13617
 ionic currents, effect on heat transfer 3=24074
 Faraday const., meas., appl. to current, electrical, unit 3=21189
 metal nitrate electrolytes, compressibilities 3=9456
 photoelectrolysis, at anthracene-electrolyte interface 3=23549
 polishing, Cu in H₃PO₄, diffusion phenomena 3=11351
 use in prep. of thin Au and Ag films 3=1367
 radiation emitted from Al electrode 3=1395
 Soret effect, heat of transport, theory 3=13615
 Ag-Zn alloys, transport numbers, various phases 3=11354
 Al, a.c. oxidation, luminescence props. 3=10983
 Li isotope enrichment technique 3=13617

Electrolytic deposition

- activation overpotential growth, solns. 3=13613
 anodic films, Ta and Nb, composition by radio tracers 3=25830
 targets and radioactive sources of Co, Cu, Ag 3=24532
 Co-P, mag. props. 3=11052
 Cd(OH)₂, films, thin, crystallization, kinetics 3=16170
 Cr, isotopic foils for nuclear investigations 3=24533
 Cu containing Mo, intergranular brittleness 3=3237
 Fe in FeO layer between Fe plates 3=25831
 Nb, anodic film, structure 3=23507
 Ta, anodic film, structure 3=23507
 Ti, from aqueous solns., mechanism 3=16176
 Zr, anodic film, structure 3=23507

Electromagnetic fields

- asymptotic integral invariants 3=18706
 baryon interaction, in Rayski manifold 3=4334
 coherence, definition formula 3=19437
 covariant expansion 3=5818
 cylindrically symmetric fields 3=472
 dipole, vertical magnetic, above earth's surface 3=19439
 earth, a.f., 140 c/s, effect of cond. inhomogeneities 3=16230
 electric dipole, l.f., on conducting half-space 3=14740
 electron, uniformly moving, rel. to wave eqn. 3=10089

Electromagnetic fields — contd

- in excited or stationary media, integro-differential eqns. 3=2088
- horizontal mag. dipole, near magnetoplasma half-space 3=21978
- interaction with plasmoid, higher multiple moments 3=24290
- inside layer with negative absorption coefficient 3=14796
- levitation effects in axially-symmetric system 3=24434
- magnetic dipole, effect of prolate spheroidal core 3=24436
- magnetic dipole oscill. parallel to axis of infinite cylinder 3=19417
- magnetodielectric disturber, energy changes 3=21945
- molecular group, three-body dispersion energy 3=20032
- non-singular, associated with Bonnor vacuum grav. field 3=16519
- from nuclear explosions, underground 3=11380
- nuclear magnetic resonance, in crystals 3=20666
- occurrence in quaternion quantum theory 3=16524
- particle vibration damping in periodic field 3=9911
- Petrov types of vacuum metric, theorem 3=3713
- plasma, absorption resonances in mag. field 3=7614
- plasma, fluctuations 3=21769
- plasma, heating, magnetoacoustic reson. 3=7613
- in plasma, non-magnetic quasineutral, calc. 3=12296
- propagators and commutators 3=3733
- quantization 3=7765
- quantum theory, geometrized class of Yang-Mills fields 3=17187
- radiation of cylinder, axially slotted, coated with inhomog. dielec. sheath 3=24431
- stress tensor, asymmetric, continuous medium, mechanical and e.m. fields 3=19420
- teaching demonstrations 3=5813
- tensor field and Larmor and Kottler potentials 3=5817
- transformation under restricted Lorentz group 3=5320
- two-level quantum system, coupling 3=3744

Electromagnetic oscillations

- See also Magneto-hydrodynamics; Masers; Plasma oscillations.
- amplification, travelling wave, mechanical analogue demonstration 3=21191
- amplifiers and frequency converters, tunnel diode low-noise, microwave 3=6610
- amplifier noise minimum, rel. to uncertainty principle 3=5842
- cavity, co-axial, reson., TE_{0mn} modes 3=19441
- cylindrical resonator, with coaxial ferrite tube, mat. freq. 3=4267
- in electron beams, interpenetrating, in a magnetic field 3=7641
- e.l.f. (< 1 c/s) from small explosive charges in air and water 3=4265
- ellipticity analysis 3=19467
- ferrite, parametrically coupled, theory 3=17047
- heterodyne spectral noise analyser 3=19163
- klystron, frequency stabilization 3=9926
- klystron stabilizer, 10 kc/s Pound-type 3=14765
- maser spectrum, rel. to classical nonlinear self-oscillators 3=5889
- microwave devices, study using e.p.r. probe 3=14775
- millimetre, generation and amplification, survey 3=5835
- oscillator for variable energy cyclotron 3=5836
- oscillator, microwave, high stability, tunable 3=7695
- oscillators, negative resistance and relaxation 3=9697
- plasma, Kr, shock produced, coupling to micro-waves 3=16943-4
- prod. by Doppler freq. multiplication from semicond. depletion layer 3=9927
- quantum noise in linear amplifiers, theory 3=5837
- quartz resonators, transient freq. excursion 3=14764
- radiation of oscillator moving in dielec.-filled waveguide 3=24477
- resonator, dielectric microwave 3=487
- resonator, dielectric system, with totally-reflecting layers 3=2123
- resonator, X-band, for paramagnetic resonance, at liquid helium temps. 3=5884
- semiconducting InSb, effect of mag. field, 77°K 3=6591

Electromagnetic oscillations — contd

- superconducting cavity Q, 2856 Mc/s 3=19443
- Kr, plasma, shock produced, coupling to micro-waves 3=16843-4
- KTaO₃, crystal, microwave converter, up to 5 Gc/s 3=17936

Electromagnetic wave propagation

- See also Absorption; Diffraction, etc.
- over absorbing surface, expt. verification 3=12310
- antiferromagnetic medium, plane wave soln. 3=25549
- in active dielec. slab 3=24465
- "anti-waveguide", in a non-uniform layer 3=18700
- beam-type microwave amplifiers, noise factor 3=9853
- Cherenkov and transition radiation from e.m. wave front 3=5981
- coupled transmission systems, circuit theory 3=503
- crystals, spatial dispersion 3=15644
- crystals, transparent, special nonuniform waves 3=15645
- cylinder, long, loop excitation of travelling waves 3=4272
- delay line for u.h.f. using YFe garnet 3=14778
- developments, conference 3=11675
- dielectric semi-space, coupled with elasto-plastic waves 3=5824
- diffusion of e.m. fields in conducting medium, equiv. network study 3=506
- discontinuous conductor, polarized wave 3=9928
- dispersion eqn. for plasma 3=1962
- dispersive medium, review 3=17033
- elastic conducting semi-space in a mag. field 3=16691
- ensemble-average wave in irregular gases 3=17048
- ferrites, dielectric const. and loss at high temps. 3=22978
- ferromagnetic sample, effect on magnetostatic modes 3=23212
- in ferroelectrics, interaction with sound waves 3=2949
- fluctuating medium, statistical theory 3=21973
- FM to AM light conversion using birefringent crystals 3=9628
- frequency conversion in non-linear media 3=14768
- γ-ray velocity constancy 3=22098
- γ-rays, 14 keV from Fe⁵⁷ search for effect of magnetic field 3=2132
- in geological conductors, r.f. 3=9944
- in gyromagnetic media 3=24466
- helicon propag. in conductor, rel. to magnons 3=20570
- Huyghen's principle, relationships with, isotropic medium 3=16496
- over inhomogeneous earth, field strengths 3=9943
- inhomogeneous medium, attenuation and transient rad. by particles 3=14769
- ionized gas, energy equipartition 3=7556
- ionospheric disturbances, WWV reception in the Arctic 3=11433
- light vel. meas. by μ_0 , ϵ_0 , teaching expt. 3=5508
- magnetolectric media 3=2855
- magnetosphere, guidance 3=9942
- in medium with continuous energy spectrum 3=6499
- in medium with spatial dispersion 3=4845
- medium with strong refr. index fluctuation 3=21972
- metals, extinction theorem, plasma theory 3=17049
- microwave, in paramag. salts, rel. to spin-lattice interaction 3=18139
- mixed boundaries, two-dim. and spherical analysis 3=9930
- molecular crystals, dispersion theory 3=23037
- moon, point-to-point communication on surface 3=9174
- one-dimensional, for long waves 3=14023
- periodic structures, rel. to multiple scattering 4=7697
- plane parallel layer, internal field, self-excited 3=5843
- in plane parallel plate, nonlinear optics 3=488
- plasma, hot, mag. confined, right-circularly polarized microwaves 3=19252
- plasma particle beam, excitation across 3=21788
- plasma, amplitude modulation, theory 3=500
- plasma boundary, coupling with m.h.d. wave 3=16963
- plasma boundary, coupling to plasma oscill. 3=9818
- plasma, with Cauchy equil. distrib., dispersion 3=9794
- plasma, cold, radiation, 9000 Mc/s 3=9787

Electromagnetic wave propagation — contd

- plasma column, magneto-ionic, theory 3=501
- plasma, coupling with electron wave 3=12213
- plasma, drifted, transverse 3=17693
- plasma, electron density and collision frequencies, micro-wave meas. 3=410
- in plasma, guiding along magnetic field 3=9941
- plasma, high-temp, rel. to elec. conductivity 3=7554
- plasma, interaction, analysis 3=5667
- plasma, interaction at free space boundary 3=9789
- plasma, limit cases 3=4132
- in plasma, l.f. by ions and electrons 3=16938
- plasma, in mag. field, rel. to polarization 3=7551
- in plasma, magneto-active, effect on charged particle motion 3=16946
- plasma, matching at gradual boundaries 3=1986
- plasma, non-linear 3=9792-3
 - in plasma, normal to mag. field 3=4138
- plasma, quantum and classical 3=16941
- plasma, quantum, h.f. cond. in mag. field 3=14580
- in plasma rel. to viscosity, thermal cond., and thermoelectricity 3=7549
- plasma resonance, plasma and electron density 3=19251
- plasma, r.f., in uniform mag. field 3=4133
- plasma, r.f. slow modes 3=12134
- plasma sphere in mag. field, resonances 3=7537
- plasma stream in medium of high refr. index 3=1985
- in plasma (warm), along mag. field, theory 3=1984
- plasma, Vlasov, in external mag. field 3=14582
- plasma, Vlasov, transverse theory 3=14581
- in plasma with doubly humped velocity distrib. 3=2002
- plasmas, near equil., in absence of mag. fields 3=9788
- plasmas, microwave multiple-probe system 3=4153
- polarization props. of hollow cone 3=12311
- p-polarization in totally reflecting filter 3=4268
- quantization, in crystals 3=2703
- radially inhomog. spherical medium, dyadic Green's function 3=24467
- radiation transfer eqn. for aspherical scatt. 3=7696
- radio pulse transmission, noise elimination 3=7713
- r.f. signal phase modulation by plasma fluctuations 3=4134
- random medium, phase quadrature components 3=7694
- re-entry radio blackout, elimination 3=7059
- semiconductors, degenerate, quantum plasma theory 3=25337
- semiconductors, "helicon" mode propagation for metre and decametre waves 3=22921
- semiconductors, plasma theory appl. 3=6568
- space and time isotropy, in 4 dimensions 3=5332
- sphere, corrugated, resonant charact. 3=19442
- spherically stratified media 3=9929
- statistical theory for data analysis 3=502
- stratified flat conductor, mag. field at surface 3=4243
- terrestrial waves, zonal harmonics theory 3=5855
- theory, dyadic Green's functions 3=21971
- transformation at conductor boundary, in magnetic field. 3=208
- transhorizon loss, rel. to surface refr. 3=513
- transmission delay line, using Permalloy film 3=14732
- transmission, optimum conditions, rel. to Beer's law 3=24041
- in transparent medium, nonlinear interactions, eqns. 3=24468
- in quartz, harmonics, intensities and polarizations 3=24468
- v.l.f., diurnal var., seasonal evolution 3=9945
- variable media, boundary value calc., quasi-static series, improvement 3=24461
- Ge, magnetoplasma reson., microwave 3=2893
- He gas discharge, 35 and 10 kMc/s, rel. to mag. field 3=4031
- Na, magnetoplasma resonance, satellites 3=25259
- atmosphere**
 - amplitude and phase fluctuations, correlation 3=19458
 - amplitude and phase spectra of radio-atmospherics 3=25891
 - angels, rel. to high-level temp. inversion 3=1452
 - diffraction by inhomogeneous layers 3=19457

**Electromagnetic wave propagation — contd
atmosphere — contd**

- earth-ionosphere wave guide, v.l.f. radiowave propag. 3=16257-8
 - fluctuation, rel. to inhomogeneity transfer 3=19459
 - guided along thin atmospheric or exospheric layer 3=14779
 - height finding, correction of refrn. errors 3=9948
 - height-gain for v.l.f. waves 3=9950
 - line-of-sight transmissions, frequency variance rel. to turbulence 3=12321
 - noise, amplitude—probab. distrib. function 3=5858
 - nuclear explosion, high-altitude, effects, v.l.f. 3=12324
 - from nuclear explosion, interact. with earth's mag. field 3=7717
- phase-frequency spectra from atmospheric wave-forms 3=6966
- pulse propag. over finitely cond. earth 3=1451
- radar refraction rel. to horizontal refractivity variations 3=17061
- radio horizon distribution variation on 108 Mc/s, satellite meas. 3=12322
- refraction of cm waves, radiometric det. 3=9949
- refraction prediction from surface data 3=21055
- refraction, total, rel. to surface refractivity 3=9947
- refractive index, spectra, up to 5000 ft. 3=7716
- 16 kc/s GBR transmission 3=14780
- spherical earth, focusing effects 3=12323
- sweepers, rel. to solar activity 3=3475
- terrestrial e.l.f. propag., effect of ionosphere 3=16260
- transatlantic, 41.5 Mc/s modes 3=7714
- troposphere, forward scatter, model 3=5204
- troposphere, prolonged space-wave fade-outs 3=5856
- troposphere, range error for varying refractivity 3=5857
- troposphere, refractive index irregularities 3=9051
- tropospheric scatter, experimental technique 3=13687
- troposphere, scattering, wide-angle, by irregularities 3=13721
- very long distance, 12-30 Mc/s 3=24479
- v.l.f., between ground and ionosphere 3=7715
- v.l.f. (18 kc/s), phase and amplitude shifts on sunrise
- v.l.f., phase diff. between Hawaii and Tokyo 3=24480
- ionosphere**
 - absorption at long distances 3=5863
 - absorp. at low freqs., theoret. comput. 3=5865
 - absorption, D- and E- regions, short-waves 3=5880
 - absorption, D- and E-regions, time variation 3=5879
 - absorption, decametric, from nuclear explosion 3=7721
 - absorption effect, during ionospheric storm, in Arctic 3=5874
 - absorption, h.f. and v.h.f., polar cap and auroral 3=5876
 - absorption, irreg. evening, at Hawaii and Johnston Island 3=5869
 - absorption loss and max. usable frequ., slide rule 3=24483
 - absorption, low freq. sunrise effect 3=5882
 - absorption meas., anomalies 3=5866
 - absorption meas. using satellite radio waves 3=5867
 - absorption near auroral zone 3=5872
 - absorption, polar cap, May and July 1959, morphology and interpret. 3=5877
 - absorption, 2 Mc/s, at high latitude 3=5871
 - absorption, winter anomaly 3=5883
 - anisotropic, stratified, refl. of long waves 3=2135
 - aurora, reflection, oblique, 90 Mc/s 3=25934-5
 - auroral signal absorption 3=510
 - backscatter echoes 3=13718
 - backscatter from irregularities 3=13726
 - backscatter, incoherent 440Mc/s, May 1961 3=7720
 - backscatter, 300 Mc/s obs. 3=13717
 - blackouts, polar cap, long delay times, lack of relation with geomag. disturbances 3=18574
 - blackout, worldwide patterns 3=5875
 - blackouts at Terre Adélie, 1957-8 3=5873
 - blackouts, polar radio riometer obs. 3=5878
 - cosmic-noise absorption 3=7723
 - cosmic radio-noise F-absorption 3=6985
 - cosmic radio noise obs. by satellites, Z-mode propag. 3=1537
 - cosmic radio noise, 25 Mc/s, rel. to F-scatter 3=5861

Electromagnetic wave propagation — contd
ionosphere — contd

- cross-modulation, at College, Alaska, 1960, rel. to electron densities 3=6977
- cross-modulation rel. to D-region density profiles 3=6982
- curved anisotropic ionosphere, v.l.f. mode 3=19462
- diffraction by thin phase-changing layer rel. to radio star scintillation 3=11427
- disturbances, catalogue, July 1961 3=18529
- D, absorption, anomalous, winter, and temp. 3=25927
- D-region absorption, complete ionization function, time motion 3=21057
- D-region absorption, rel. to cosmic rays 3=9083
- D-region, cross-modulation and partial reflects, 2.7 Mc/s 3=6978
- D-region echoes, Sweden, rel. to layer distrib. 3=1460
- Doppler shift, non-relativistic 3=13722
- downcoming arrival angle, rel. to ionospheric tilts 3=511
- earth ionospheric cavity, e.m. resonant freqns. 3=7718
- earth-ionosphere cavity modes, freq. variations 3=12326
- earth-ionosphere waveguide, v.l.f. radiowave propag. 3=16257-8
- echoes, weak, low, under blackout conditions 3=1461
- E and χ relationship, ionisation profile variations 3=19456
- E's, moon phase effects 3=21060
- effects of 6300 A auroral arcs system 3=19460
- electric dipole admittance 3=2121
- electroacoustic, from aerials 3=11423
- electron content by Doppler integral of satellite signal 3=3494
- electron contents, from Faraday effect of Sputnik 3 40Mc/s transmission 3=16272
- e.l.f. in presence of isotropic ionosphere with exp. cond — height profile 3=508
- exosphere, "scale frequency" 3=5211
- explosions, nuclear, high-altitude, effects, 11.7 Mc/s, long-distance 3=14782
- Faraday rotation meas., v.h.f. range 3=19440
- f_{F_2} , over mag. equator, lunar tide correl. 3=1465
- F-region, elongated irregularities, wave-guide propag. 3=7719
- F-region, ionosonde and riometer obs., and collision freqs. 3=23625
- frequency-selective fading and multipath propagation 3=12330
- ground-backscatter, high-freq. rel. to solar flare 3=507
- h.f., during ionospheric storms, analysis 3=9954
- h.f., over auroral, temperate and equatorial zones, fading and attenuation 3=5870
- h.f. propag., 16 Mc/s, over 20,000 km 3=12327
- h.f. pulses, amplitude fading 3=5860
- h.f. rel. to nuclear burst in space 3=18533
- incoherent backscatter by free electrons 3=13772
- ionization effects, rel. to satellites, 1958-60 3=515
- isotropic sech² model, long waves refl. 3=2134
- lateral deviation due to spread F 3=18532
- low region, theor. model and experimental obs. 3=16254
- lower region, v.l.f. wave-fields 3=16255
- and magnetic storms, forecasting, h.f. signal strength, trans-polar 3=16303
- magnetic var. due to explosion, nuclear, high-altitude, short time delay 3=23616
- magneto-ionic mode, audiofreq. 3=12328
- magneto-ionic theory, review 3=5864
- mathematical problems 3=16247-8
- m.u.f. increase, due to F2 tilt 3=7722
- multislab concept and limit to continuous ionosphere 3=9952
- nuclear explosion, high altitude, 9 July 1962, effects of 3=25924-5
- nuclear explosion, high-altitude, effects, 10 Mc/s 3=12324
- oblique propag., path length and deviation 3=16253
- penetration of v.l.f. radiowaves 3=16259
- phase paths, effect of irregularities, model 3=3497
- phase paths, rel. to irregularities 3=13723
- plane waves in horizontally stratified ionosphere 3=512
- polar, absorpt., correl. with new class of solar flares 3=16376

Electromagnetic wave propagation — contd
ionosphere — contd

- polar cap absorption, particles study 3=13795
 - polar-cap absorption, 10 Nov. 1961 3=509
 - polar-cap, h.f. oblique-incidence circuit effects 3=14783
 - polarization meas., rel. to magnetoionic theory 3=9079
 - radio star scintillation, zenith-angle dependence 3=11426
 - reflections, 2.28 Mc/s pulsed, phase fading 3=4278
 - reflection light, from Schlömilch's eqn. 3=12331
 - reflection and transmission formulae 3=9955
 - reflection, v.l.f., from exponential variation 3=19463
 - refractive index and attenuation meas. rel. to electron densities 3=6983
 - round-the-world, step frequency pulse 3=19464
 - satellite scintill. at 54 Mc/s, analysis 3=13725
 - satellite scintillation in auroral zone 3=12325
 - satellite signals, scintillation 3=18531
 - F-scatter, theory, rel. to spread-F 3=11439
 - scattering effects in long-distance propag. 3=19461
 - scattering, including collisions, calc. 3=16942
 - scattering, incoherent, by free electrons 3=7702
 - scattering, wide-angle, by irregularities 3=13721
 - scintillations, radio star and satellite, variation with zenith angle 3=21124
 - scintillation, satellite, 54 Mc/s, irregularity distrib. 3=23617
 - screening effect in satellite reflection 3=5862
 - short period fading and Faraday rotation 3=11587
 - short-wave fadeouts, modes and complete characterization 3=5868
 - SID and SNCA effects at 164 kc/s 3=13735
 - solar eclipse effects at low and medium freqn. 3=6979
 - spherical waves, through anisotropic irregularities 3=514
 - sporadic-E, equatorial, theory 3=11436
 - spread F development, and high altitude nuclear explosion 3=9085
 - spread-F equator, variations, theory 3=11438
 - spread-F irregularity prod., theories 3=3507
 - spread-F, lunar variations 3=2133
 - spread-F, nocturnal and seasonal var. 3=9087
 - spread-F, occurrence at mag. conjugate points 3=5218
 - spread-F, correl. on one night and successive nights 3=5217
 - spread-F, rel. to effects of nuc. explosions 3=3486
 - spread-F, rel. to parameters of F-region 3=3504-6
 - sudden ionospheric disturbances, night time, enhancement of long-wave (27kc/s) atmospherics 3=6965
 - three-fluid theory 3=16250
 - time, var., diurnal, rapid seasonal changes, Arctic circle, v.l.f. 3=24481
 - top-side ionograms, polar and mid-lat. 3=23614
 - top-side spread echoes 3=11431
 - transhorizon transmission loss, rel. to surface refractivity 3=513
 - v.l.f. disturbances, rel. to nuclear explosion of July 9, 1962 3=12329
 - v.l.f., eqns. for horiz. stratified ionosph. 3=5859
 - v.l.f. excitation in earth-ionosphere waveguide 3=9953
 - v.l.f., long-path diurnal phase changes 3=24482
 - v.l.f. pathlength and amplitude, rel. to high-altitude thermonuclear explosions 3=9951
 - v.l.f. penetration through sharp boundary 3=23613
 - v.l.f., phase fluctuations, effect of sunrise and sunset 3=14784
 - v.h.f. pulse, scattered 3=21054
 - v.h.f., trans-equatorial, anomalous, diurnal, var. 3=14781
 - wave equation in dipolar coordinates 3=16252
 - Z-mode, ray tracing, parabolic model 3=23615
- guided waves**
- amplification, mm-wave, by reson. saturation 3=14767
 - broad waveguide, diffn. by large object 3=496
 - closed end, reflection, arbitrary angle end 3=19449
 - coaxial, modes and wavelengths, calc. methods 3=24473
 - coupled waveguides theory 3=24471
 - coupled wave theory, discontinuity problems 3=24478
 - cylindrical waveguide containing radially inhomog. plasma 3=7709
 - in dielec. coated wire, propagn. modes 3=491

Electromagnetic wave propagation — contd

- guided waves — contd**
 for dielectric const. meas. of low-loss liquids 3=21676
 dielectric elliptical waveguides 3=504
 dielectric fibres, evanescent boundary wave propagation 3=17060
 dielectric rod waveguide, HE₁₁ mode, theory 3=9937
 dielectric wires as mm waveguides 3=19452
 dispersion, iris-loaded cylindrical waveguides, calc. 3=9940
 earth-ionosphere waveguide, v.l.f. radiowave propag. 3=16257-8
 EH type in circular guides with metallic irises 3=5851
 ferrites, use 3=24475
 finite-difference calc. methods 3=14773
 Harms-Goubau single line as surface guide 3=2126
 helical waveguides, general theory 3=14774
 interaction of microwaves with exploding wires 3=4103
 light, coherent, by fibres, reflecting tubes, lense tubes 3=21510
 m.h.d. travelling-wave devices, skin effect 3=21967
 microwave filters 3=492
 particle accelerator, cyclic, beam stability 3=14696
 photons, large curvature, and test for spin inertia effect 3=19599
 plasma, cold column, in cavity 3=7553
 plasma columns, annular, backward waves 3=4276
 plasma column interaction; resonance peaks 3=7611
 plasma-loaded waveguides, mode coupling 3=9935
 plasma meas., cavity method 3=19278
 in plasma, slow waves 3=5850
 plasma waveguide, nonlinear theory 3=19455
 in p-n GaAs junctions, dielectric waveguide 3=10851-2
 rectangular guide with magnetized ferrite slabs 3=9939
 rect. r.f. pulse distortion, complex propagn. const. 3=505
 semiconducting p-n junctions, light 3=23042
 semiconductors in waveguides, surface effects 3=19454
 surface waves, in two-dielectric system 3=7710
 switching tubes, microwave, gas, hot-cathode 3=7490
 TEM modes and circular polarization 3=9936
 transmission line — waveguide equivalence 3=2128
 transmission lines, nonlinear, travelling wave harmonic generation 3=4277
 transmission lines, nonuniform, and stratified layers 3=19451
 travelling-wave tube, as pulsed photo-emission detector and scintillation counter 3=2130
 turnstile junction, for meas. polarization 3=9938
 twin transmission line containing plasma in glass envelope 3=7550
 bet. two metallic planes, one of which is anisotropically absorbant, by geometrical optics 3=12319
 waveguide, beam-plasma system 3=2127
 waveguide, dielec.-filled, radiation of oscillator 3=24477
 waveguide with ferrite plates against opposite side 3=12320
 waveguide filled with plasma, excitation 3=7712
 waveguides with long electron streams, wave interact. 3=21979
 waveguide partially filled with dielec., particle motion 3=7683
 waveguide, plasma-filled, wave structure 3=24476
 waveguide, solid 2-dimensional model, sharp boundaries 3=7711
 waveguide, TE mode, containing semiconductor 3=2875
 waveguides, plasma-filled, fast waves 3=2129
 waveguides, plasma-filled, wave propag. and electron beam interaction 3=7707
 waveguides, rectangular, partially filled with gyro-mag. and gyro-elec. medium, propagation constant 3=5849
 waveguides, ridge coaxial, theory 3=17059
 MgTiO₃ disks in microwave cavity 3=13112
 TiO₂ disks in microwave cavity 3=13112

Electromagnetic waves

- See also Diffraction; Reflection, etc.; Light, electromagnetic theory.
 amplification, mm-wave, by reson. saturation 3=14767
 analytic represent. of wide-band signals 3=14761

Electromagnetic waves — contd

- cavity resonators, ferrite-loaded, e.m. and magnetostatic mode coupling 3=14777
 coherence, and masers, optical 3=12338
 conference, Copenhagen (1962) 3=12308
 on crystal surfaces, optically active, exciton excitation 3=20140
 discharge prod. without electrodes by microwaves 3=21726
 electron motion, relativistic, in external field 3=24438
 e.m. fields, quantum-mechanical correl. theory 3=9654
 energy density meas., absolute 3=14762
 entropy, quantum statist. study 3=484
 for freezing detection, small volumes 3=16837
 and gas, electron temp. 3=14529
 gravitational waves, analogous to electromag. waves 3=21211
 Helmholtz eqn., Miyamoto-Wolf formula for vector pot^l, geometrical derivation 3=1785
 h.f., interaction with plasma cylinder 3=1981
 interaction between dielectric or plasma and resonant cavity 3=14776
 interaction with solids, from atoms, relaxation, theory 3=20070
 meas. precision, conference, Boulder (1962) 3=12309
 mechanical prod. at conducting semi-space in a mag. field 3=16691
 micropulsations ($\lambda \approx 10^9$ - 10^{10} m), review appl. to geophysics 3=485
 microwave frequency converter based on Hall effect 3=10864
 microwave power measurements 3=12042
 microwave technique appl. to ionized gases in shock tubes 3=1934
 mm wave microcalorimeter 3=12043
 plane parallel layer, internal field, self-excited 3=5843
 in plasma, excitation when electron vel. is directed rel. to ions 3=21849
 plasma heating, circular polarization 3=21786
 plasma, magnetically active, with large refractive index, permittivity 3=14584
 plasmas, non-Maxwellian, microwave emission 3=5657
 polarization, meas. using turnstile junction 3=9938
 polarized, 35 kMc/s, thermal effects on plasma 3=9784
 polarized plane waves, composition 3=1838
 radiometer for noise source standardization 3=21980
 radiation reaction, classical theories, review 3=17163
 radiation recoil, classical, calc. 3=16515
 reception of partially polarized wave, coherence 3=489
 reception of quasi-monochrom., partially polariz. 3=489
 reception, thermal and quantum noise comparison 3=2119
 recoil of emitting system, conditions 3=5838
 relativity, general, solution, plane waves in vacuo 3=18721
 resonance, with charged particles 3=7681
 and superconducting tunneling currents, Al-Al₂O₃-Sn junctions 3=21660
 transverse-longitudinal conversion, at dielectric-plasma boundary 3=9956
 velo. and cosmic gravitational field potential 3=16504
- radiators**
 aerial array, h.f., low-propagation angles 3=19450
 aerial, dipole, cylindrical, theory 3=12318
 aerial meas., effect of finite dissipative medium 3=21977
 aeriels, corona breakdown 3=5854
 aeriels, large non-uniformly spaced linear arrays 3=7708
 aeriels, power meas. using e.m. wave resonators 3=4266
 aeriels, radio, meas., 36 m, 53-67 cm 3=25976
 aeriels, satellite-borne, for radioastronomy 3=23703
 arcs, electric, plasma-metal, cathode spot, switch, high speed 3=14766
 charged particle, fast, passing close to wedge vertex 3=21968
 charged particle moving in cyl. stratified media 3=16241
 current filament clad by mag. anisotropic plasma sheath 3=19438
 dipole aerial, behaviour in ionosphere 3=16262
 dipole aerial embedded in dielec. spheroid 3=17046
 dipole aeriels, long, driven from coaxial lines 3=5852

Electromagnetic waves — contd

radiators — contd

- dipole, effect of plane finitely conducting earth 3=24464
- dipole in lower ionosphere, v.l.f. admittance 3=16263
- dipole, vertical mag., above earth's surface, e.m. field 3=19439
- discharge, PIG, electron gyrofrequ. harmonics 3=7465
- electric dipole admittance in magneto-ionic environment 3=2121
- electric dipole aerials, dielec. loading 3=486
- exosphere, cyclotron-generated noise 3=23606
- ferrite, in pulsed mag. field, 8 kMc/s 3=24463
- ferrite sphere, at ferromagnetic resonance, fluctuation radiation 3=6739
- gas discharge in strong mag. field, r.f. emission 3=14535
- Ge, hot electrons, harmonic generation 3=21969
- horizontal mag. dipole, near magnetoplasma half-space 3=21978
- in ionosphere, electroacoustic wave excitation 3=11423
- line source in plasma 3=7601
- long aerials, impedance in air and dissipative medium 3=19453
- magnetic dipole, moving, radiation calc. 3=4250
- magnetic line dipole source 3=2120
- magnetoplasma, microwave radiation 3=12115
- masers, quantum statistics of single mode 3=12356
- microwave aerial in hollow dielec. wedge 3=12317
- plane, from horn and dielectric strip lens 3=21970
- plasma, microwave noise emissivity 3=1968
- plasma, microwave region 3=7536
- radioastronomical receiver, L-band, travelling wave tube 3=7045
- short aerial, impedance in ionosphere 3=16261
- thin circular loop aerial, current distrib. 3=5853

Electromagnetism

- See also Electrodynamics; Quantum electrodynamics.
- constitutive eqns., plasma-like medium 3=21947
- Einstein-Rosen manifolds, initial-value problem 3=18705
- electric displacement currents, rel. to magnetic fields 3=12293
- e.m. field diffusion in conducting medium, equiv. network study 3=506
- energy-momentum tensor of field, uniqueness 3=1604
- Faraday's and Ampere's laws, rel. to Maxwell's eqns. 3=14738
- field of dipole above cond. lamella 3=21946
- formalized system of equations and units 3=12292
- and gravitation 3=7108
- Green-Wolf complex scalar potl., stochastic generalization 3=5816
- lines of force, boundaries 3=5823
- Lorentz condition generalization 3=24432
- magnetic field diffusion into conductor, with moving boundary condition 3=17025
- Maxwell's eqns, conformal properties, review 3=5317
- Maxwell's eqns. for cold plasma, solution 3=382
- Maxwell's eqns., as props. of the vortex sponge 3=24430
- Maxwell eqns., relativistic formulation 3=14739
- Maxwell's eqns., text-book derivations 3=471
- Mie's theory, soln. for static radial potl. 3=4249
- plasma, linear 3=21769
- precision measurements, conference, Boulder, Aug. 1962 3=9689
- ring current, self-consistent calc. 3=5814-15
- Schiff's charges and currents, rotating matter 3=21937
- small loop moving with magnetostatic dipole 3=5810
- solenoids, coils, loops, calc. of fields, forces inductances 3=21939
- spin, Thomas's classical theory 3=5329
- term "field", teaching comments 3=14737
- torque on cond. slab by rotating mag. field 3=7679
- unified field theory with gravitation 3=1603
- unified theories 1934-44 3=14017
- unipolar machines, field-producing magnet action 3=14741
- units, rationalized system, interpretation possibilities 3=5313
- van der Waals interaction between two macroscopic bodies 3=2090

Electromotive force

- Faraday's law, special relativity analysis 3=17031
- measurement, NBS standard volt box 3=14472

Electron annihilation

- See Electron pairs, annihilation.

Electron beams

- See also Electron optics; Particle accelerators.

- in accelerator, effect on accelerating system 3=19376
- axially symmetric, in terms of line integrals 3=18694
- beam-plasma system, electron beam generated, in neutral gas 3=21815
- blurring, rel. to thermal velocity 3=19335
- bursting conditions with interpenetrating beams 3=4190
- use in chemical microanalysis, by X-rays excitation 3=13632
- clustering, in synchrotron, axial and radial variation 3=4193
- compensated, limiting stable current 3=7643
- current meas. from accelerator 3=9883
- current meas., 10^{-4} - 10^{-10} amp, integrator 3=14650
- cyclotron wave nonconvective instability 3=4162
- cylindrical beam, in elec. field, potential difference 3=24359
- defocusing, space-charge-controlled 3=441
- electron gun, with temp.-limited cathode 3=432
- electron probe microanalysis, atomic no. effects 3=13630
- electrostatic field, in plasma, periodic distrib. 3=21873
- energy distrib. after thermionic emission 3=12247
- energy loss in metal foils, theory 3=73
- energy loss, in passage through Ag film 3=20152
- energy losses in inert gases 3=21880
- energy spectra, meas. with electrostatic analyser 3=2039
- energy-spread statistics, Boersch effect 3=24357
- flow, perturbation, error in basic eqn. 3=24358
- focusing, by r.f. fields on slow-wave circuit 3=5709
- focusing, electrostatic, in microwave valves 3=5708
- focusing, gun, hollow-beam, high-convergence 3=5701
- focusing, magnetic, effect of transverse velocities 3=5706
- focusing, periodic, annular beams 3=5705
- focusing, periodic, field injection conditions 3=5707
- focusing, reversed field systems 3=9857
- guns, high-perveance, iterative computation 3=5700
- guns, low voltage 3=12245
- guns with curved trajectories, electrode shapes 3=24349
- gun, high-power, for vac. conditions 3=14649
- gun, higher stability 3=24350
- guns, Pierce, conical flow, anode aperture effect 3=4191
- guns, 100 kV, voltage production 3=14652
- helical, moving in plasma, self-modulation 3=7608
- in impulsive discharges, energy meas. 3=7452
- instabilities in plasma-beam system in mag. field 3=7625
- intense, in plasma, instability 3=436
- intensity increase, investigation 3=19333
- intensity meas., 40-60 keV, by CdS conductivity effect 3=4198
- intensity, posn. meas. with signal electrodes 3=5726
- interaction of electron-ion beam with plasma 3=24284
- interaction, gap, with e.m. fields, linear space-charge theory 3=5696
- interaction with gyrotropic plasma 3=9781
- interaction with periodic elec. and mag. fields 3=12243
- interaction with plasma, energy loss 3=9780
- "Intercol" system 3=19330
- from intermittently heated source, energy distrib. 3=19336
- ion focusing 3=21875
- and ions, neutralized, mag. barrier penetration, calc. 3=19423
- laminarity, criterion and rel. to anode lens 3=9854
- linear transport elements, boundaries 3=14654
- metal-insulator-metal films, tunnelling time 3=1611
- microtron radn. 3=5800
- monitor for very low beam currents 3=24355
- multi-velocity, single-velocity analysis 3=14651
- multivelocity, signal-current-excited, space-charge-wave decay 3=16982
- noise on a drifting Maxwellian beam 3=9853
- nonlinear, kinetic power nonconservation 3=435
- oscillations, transit time 3=19337
- optimally-focussed, space-charge limited, power density 3=24356

Electron beams — contd

- oscillations, l.f., in mag. field 3=9823
- O-type, non-linear phenomena, review 3=5698
- oxide-cored cathode source 3=9832
- particle accelerator, linear, beam position monitor 3=5728
- plasma-beam system, magnetodynamic instab. 3=21834
- polarization meas. by electron-electron Møller scattering 3=19331
- polarization after transmission through Fe foils 3=2042
- polarization due to relativistic radn. in magnetic field 3=437
- polarized, from ferromagnetic, on i.r. absorpt., possibility 3=12248
- power density of space-charge-lim. beams 3=4192
- power theorem, fundamental 3=5702
- probe meas. of discharge elec. fields 3=24154
- profile, with linear focusing and space-charge effects 3=12254
- relativistic, dense, generation 3=19334
- relativistic, ribbon, formation, shaping electrodes 3=12246
- r.f. behaviour, nonlinear, of beams with rel. distrib. 3=24353-4
- scattering light, from ruby laser 3=16803
- scattering in plasma, mechanism 3=7500
- sheet, water-bag model 3=4189
- small signal power theorem 3=433
- small signal power theorem, potential form 3=434
- solids, energy losses rel. to diffraction patterns 3=2779
- space-charge correction, first-order 3=21872
- space charge, ion compensation, electron current multiplication 3=19338
- space charge waves, in relativistic Brillouin beams 3=5697
- spin polarization investigations 3=19332
- spreading, in high intensity beams 3=19338
- stability in bounded systems with decelerating elec. fld. 3=7642
- streams, three dim.-less parameters 3=12244
- synchrotron bunch size during special operation mode 3=5797
- transmission through dielectric tubes of pulsed beams 3=9858-9
- waves, propagating, velocity modulation 3=16981
- waveguides with long electron streams, wave interact. 3=21979
- Wien filter, use as monochromator 3=4195
- absorption**
- See Electrons, absorption.
- effects**
- See also Beta-rays, effects.
- annealing furnace, electron cloud 3=5136
- cathodoluminescence, kinetics and efficiency 3=971
- cathodoluminescence, trapping mechanism 3=3064
- chemical analysis, microanalyzer, quantitative accuracy 3=18466
- chemical, non-metallic crystals 3=8975
- crystals, directional depend. of defect number 3=20250
- deep penetration, general theory 3=5711
- diodes, thermionic, inert gas, neg. resist. effects 3=2026
- He⁺, ionization, calc. 3=14519
- elastic wave generation, by pulsing in solids, and beam study 3=18889
- electromagnetic oscillations, in two interpenetrating beams, in a magnetic field 3=7641
- furnace (>2000°C) 3=9647
- glass, oxygen outgassing 3=16124
- graphite, thermal cond., annealing 3=10615
- impulse discharge preionization 3=7464
- inert gases, ionization, up to 100 eV 3=19173
- ionization distrib. in solid cylinders 3=20256
- ionization, gases, inert, up to 100 eV 3=19173
- K X-ray yields, low atomic no. elements 3=23089
- mass spectra from high-energy impact on hydrocarbons 3=4013
- metals, atom displacement, threshold energy 3=10700
- metals, mechanical damage, theory 3=4897
- metals, review 3=4895
- metals, secondary emission 3=12240
- molecules, vibronic states excitation 3=22531

Electron beams — contd

effects — contd

- on plasma 3=9779
- plasma oscill. excitation in mag. field 3=21847
- plasma oscill. excitation in mag. field 3=21848
- plasma, oscillations, longitudinal, dispersion relation 3=21832
- plasma oscillations, l.f. and h.f. correl. 3=19293
- plasma oscillations meas. 3=14607
- quartz, crystal deformations and colour centre dipole losses 3=20157
- ruby, luminescence 3=4991
- secondary reactions in mass spectrometer 3=16992
- thin films, cathodoluminesc. analysis 3=11004
- water, ionization distrib. 3=14532
- on waveguide, plasma-filled 3=7707
- X-ray prod. in solid target, Monte Carlo calc. 3=21019
- Ag platelets, transparent, growth 3=3273
- AgCl, luminescence meas. 3=6671
- Al, pure and alloyed, recovery study 3=15489
- Al, prod. of elec pairs, meas. 3=17255
- Au, displacement cross-section calc. 3=155±3
- Au, resistivity annealing spectrum, defect analysis 3=2846
- BeO, cathodo-luminescence, vacuum u.v. 3=13178
- BeO, luminescence 3=15717
- CaF₂, decomposition in microscope beam 3=21004
- CaO, cathode luminescence, vacuum u.v. 3=13178
- CaO, oxygen created, luminescence 3=15717
- Cd, resistivity annealing spectrum, defect analysis 3=2846
- CdS, double-acceptor defect prod. 3=25268
- CdS, energy transport processes 3=13072
- CdS, luminescence 3=23118
- CdSe, induced elec. conductivity 3=17873
- CdSe layers, induced elec. cond. 3=2910
- CdTe, double-acceptor defect prod. 3=25268
- CO, prod. of O⁺, cross-section 3=361
- CO₂, prod. of O⁺, cross-section 3=361
- CsCl, decomposition into metal and Cl 3=17809
- Cu, effects on elastic modulus 3=796
- Cu, Frenkel pair formation, ang. asymmetry 3=20250
- Cu, internal friction, 10⁰-80°K meas. 3=18169
- Fe(50%)—Ni alloy, magnetic anisotropy energy, 280°C 3=3119
- Fe films, deflection, rel. to magnetization distrib. 3=18091
- Ge, β -conductivity, bombardment 1.5 to 30 keV 3=2885
- Ge, electron excitation into cond. band. 3=6588
- Ge, electron excitation into cond. band 3=858
- Ge, photoconductivity spectra and kinetics, deep levels, 1 MeV 3=20409
- Ge, photoelectric emission, threshold shift towards longer wavelengths 3=19314
- Ge, radiative recomb. as damage indicator 3=22862
- H atoms, excitation 3=15297
- He atom excitation, light polariz. meas. 3=8209
- He atom, optical radiation, polariz. 3=8208
- He, spectral line emission, polarization 3=2581
- KBr, trapped-hole colour centres 3=8460
- KCl, decomposition into metal and Cl 3=17809
- KCl, F and M-centre equilibrium 3=8461
- KCl, hardening and F-band coloration 3=23359
- KCl, imperfections, direct obs. with electron micr. 3=2782
- KCl, loop structures 3=12967
- KCl, trapped-hole colour centres 3=8460
- KCl—KBr mixtures, colour centres 3=10693
- KCl—RbCl mixtures, colour centres 3=10693
- La₂O₃, cathodoluminescence, activated by rare earths 3=13214
- LiF, coloration, rel. to growth method 3=25298
- LiF, trapped-hole colour centres 3=8460
- MgO, cathodo-luminescence, vacuum u.v. 3=13178
- MgO, luminescence 3=15717
- Mo, secondary emission, energy distrib., 100-1000 eV primaries 3=12240
- N⁺ ionization to N²⁺, 20-500 eV 3=21702
- NaCl, decomposition into metal and Cl 3=17809
- NaCl, trapped-hole colour centres 3=8460
- Ne⁺ ionized to Ne²⁺ 3=21703
- O₂, attachment coeff. at low energy 3=362
- O₂, prod. of O⁺, cross-section 3=361

Electron beams — contd
effects — contd

- O⁺ formation from O adsorbed on Mb, effect on vacuum ionization gauge meas. 3=21462
- RbCl, decomposition into metal and Cl 3=17809
- RbCl—KBr mixtures, colour centres 3=10693
- Si, defect prod., depth prod. 3=22858
- Si, n-type, paramag. centre 3=6750
- Si, recombination and trapping 3=8510
- Si—Au junction, secondary current 3=15603
- Si:Li, defect prod., level spectrum of localized centres 3=22849
- Si, structural defects, photocond. study 3=22764
- SiO₂, vitreous dilatations and internal stresses 3=4899
- SrF₂, decomposition in microscope beam 3=21004
- Ta, secondary emission, energy distrib., 100–1000 eV primaries 3=12240
- TiO₂, particles, melting, electron micr. exam. 3=3925
- ZnO, cathodoluminesc., mechanism 3=3047
- ZnSe, atom displacement threshold 3=8476
- ZnSe, double-acceptor defect prod. 3=25268

ionization

See Electrons, ionization.

Electron capture

See Ions, recombination; Radioactivity, electron capture.

Electron diffraction

- in crystal plate, phase relations 3=13439
- crystal with stacking fault, Moiré pattern 3=22799
- crystals, diffraction after single plasmon loss 3=10641
- crystals, superposed parallel plate-shaped 3=25789
- electron-optical bench at 20–50 Å power 3=21886
- image formation theory, rel. to optics 3=440
- micro-diffraction modification of electron microscope of 1200 kV 3=3372
- use of nearly perfect metal surfaces 3=23500
- separation of inelast. scatt. electrons, device 3=12250
- Al foil, Debye—Waller factor meas. 3=22656
- Au thin film, lecture demonstration 3=4201
- in Ge, amorphous, diffrn. intensity meas. 3=4198
- NH₃, theory 3=8220
- W, 1–206 eV, meas. and model 3=7645

Electron diffraction crystallography

See also Crystal structure, atomic.

- advantages of 1200 kV electrons 3=20951
- dislocation, and GP zone, contrast, theory and observation 3=1314
- dynamic potentials in two-beam theory 3=1307
- dynamic scattering, inelastic interactions, form factor for $9 \leq Z \leq 14$ 3=1310
- dynamical theory, matricial and semi-reciprocal developments 3=1305
- dynamical theory, recent developments 3=1301
- energy analysis for scatt. processes 3=16058
- extinction contour shift by dislocations 3=16060
- films, solid, rel. to dielectric constant 3=20962
- intensity calc. by scattering matrix expansion 3=1306
- Kikuchi reflection diags., intensity anomalies, and doubling 3=1292–3
- lattice defect diffraction contrast, theory 3=17740
- lattice defects, contrast theory, numerical methods 3=2803
- mosaic structure study by polychromatic electrons 3=6900
- net planes with large spacing, diffracting power 3=3286
- patterns, rel. to energy losses 3=2779
- recent developments, review 3=1287
- relativistic dynamical theory 3=1308–9
- scanning system for thin-film rapid transformation study 3=1278
- scattering, dynamic, correction, structure calc. 3=18293
- scattering, elastic and inelastic intensities, meas; Kikuchi lines 3=1302
- scattering, elastic, fast small-angle 3=13577
- scattering, empirical law 3=18296
- scattering, inelastic and coherent 3=1311
- scattering law, empirical relationships 3=25695
- series of superposed parallel plate-shaped crystals 3=25789
- stacking fault, Moiré pattern, theory 3=22799
- streak pattern geometry, due to reciprocal walls 3=18297

Electron diffraction crystallography — contd

- structure analysis, modern development 3=6838
 - superficial layer contraction, differentiation 3=16
 - surface mirror reflection, anomalous intensity 3=1294
 - theory, rel. to absorption coefficient 3=20965–6
 - thermal vibration effect 3=1296
 - thick crystals, intensities 3=1304
 - thin crystals, n-beam scatt. theory, various approaches 3=1303
 - tilted illumination use 3=18289
 - wave-field absorption by interference double refraction 3=1284
 - wavelength and camera length product determination method 3=16055
 - Ag film, spot pattern intensity meas. 3=1283
 - Au, colloidal, micro-crystal, anomalous contrast (squamous) 3=1316
 - Au film, spot pattern intensity meas. 3=1283
 - Au films, intensity rel. to tilting and λH 3=1295
 - BiOCl films, intensity rel. to tilting and λH 3=1295
 - BiOCl thin films, intensity varn. rel. to crystal size, tilting angle & wavelength 3=1372
 - Fe, magnetic scattering amplitude 3=1102
 - Fe₃O₄, magnetic crystal structure 3=1148
 - MgO, images, absorption coeffs, meas. 3=1299
 - NaCl films, intensity rel. to tilting and λH 3=1295
 - Sn, Kikuchi bands obs. 3=3293
 - 120 kV high-vacuum unit 3=20950
- Electron diffraction examination of materials**
- amorphous substances, background correction method 3=20952
 - apparatus for X-ray and electron studies 3=25786
 - apparatus, parallel incidence, for gas structr, detm. 3=444
 - camera, 6–600 accel. voltage, 10⁻¹⁰ mm Hg 3=13579
 - camera, for use with variable convergence microanalyser beam 3=23530
 - continuous recording of changing pattern 3=25788
 - deformation, elongation effects, crystals 3=23527
 - electrographite, after repeated rubbing 3=8787
 - films, solid, apparatus 3=6901
 - films, solid, mag. analysis method 3=5014
 - heavy metals, reflection, rel. to surface state 3=18403
 - liquids, aliphatic 3=21305
 - metal foils, stresses, internal 3=20702
 - metal layers, f. c. c., on oriented Ag, Pd, Ni films, structure 3=1371
 - mica, dislocations, multiple contrast 3=20189
 - microprobe, Castaing, secondary emission 3=7637
 - molecules, diatomic, temp. effect on diffraction patterns 3=17549
 - moonstone, crystal unmixing 3=20975
 - organic single crystals, superposed images, striations 3=18405
 - pattern intensity meas. with scanning photo-multiplier 3=1288
 - scanning, apparatus and experimental technique 3=18404
 - scattering, small-angle inelastic, theory 3=4856
 - specimen holder, for gas—metal reaction up to 1000° C 3=1384
 - urea 3=3310
 - whiskers of Mo and W oxides 3=3374
 - whiskers, twist det. from diffractogram dynamic fine structure 3=3275
 - Al—Cu, apparatus 3=25786
 - Al, characteristic energy losses 3=4858
 - Al-1% Mg, vacancy loops 3=22752
 - Au—Si films 3=3354
 - BaTiO₃, ferroelectric domain obs. 3=13113
 - Bi, amorphous, films 3=16123
 - Bi, films, on Bi cleavage faces, by thermal evaporation 3=16136
 - Co—Al alloys, free magnetic metal, on oxidation, around Curie point 3=11337
 - Cr, Cr + Ni, films, vacuum evaporated, on C at 400°C 3=16143
 - Cu₂O, films, sputtered, growth structure 3=16139
 - Fe—Al alloys, free magnetic metal, on oxidation, around Curie point 3=11337

Electron diffraction examination of materials — contd

- Fe₂O₃, $\gamma \rightarrow \alpha$ phase transformation 3=11204
- Ga₂Se₃, films, amorphous structure 3=20915
- Ga₂Te₃, films, amorphous structure 3=20915
- Ge, apparatus 3=25786
- Ge, forbidden 222 electron reflection 3=23440
- Ge—Si system, heterodiffusion 3=22808
- In, liq., superheated, structure study 3=9440
- InSe, amorphous, short-range order meas. 3=13515
- In₂Se₃, films, amorphous structure 3=20915
- In₂Te₃, films, amorphous structure 3=20915
- Mg—Au films, orientation 3=20924
- MgO, anomalous absorpt. effects on intensity 3=25802
- Na soap films 3=16145
- NaCl, films, orientation, var. with vapour stream angle 3=13561
- NaCl whiskers, twist 3=3275
- Nb, anodic film structure 3=23507
- Nb oxides, formation, on heating Nb films and powder 3=13458
- Ni as plated deposits 3=13450
- Ni films, mag. analysis 3=5014
- Ni + Cr, Cr, films, vacuum evaporated, on C at 400°C 3=16143
- NiO, antiferromag. 3=3135
- NiO, antiferromag. structure 3=1157
- Pt—C replica technique 3=18420
- Pt, (100), (110) faces with CO absorbed, gas atom scatt. 3=6899
- Sb, films, on Sb cleavage faces, by thermal evaporation 3=16136
- Sb₂Se₃, films, amorphous structure 3=20915
- Sb₂Te₃, films, amorphous structure 3=20915
- Si, energy analysis of pattern 3=16058
- Si—Fe crystals, deformation bands 3=8912
- Sn, liq., supercooled and superheated 3=9440
- Ta, anodic film, structure 3=23507
- Zr, anodic film structure 3=23507

Electron emission

See also Fluctuations, electrical; Photoelectric emission; Photoelectricity; Thermionic emission, electrons.

- Auger, from solid surfaces, apparatus for studying 3=14619
- back diffusion in N, H, Ar 3=5693
- cathodes in gas discharges near zero field 3=14617
- cathodes, thermionic, zero-field emission 3=423
- counter, Geiger, high vacuum and in atmosphere 3=24219
- in diode, space-charge analysis 3=21868
- duoplasmatron as electron source 3=12224
- electrodes for axially symmetric electron gun 3=18694
- electroerosion effect with RC type circuit 3=7473
- electron gun, with temp.-limited cathode 3=432
- exoelectrons, point air-flow counter 3=14815
- exo-emission, effect of positive ions 3=5688
- exo; in loss of water of crystallization 3=5689
- in glow discharges common and hollow, photon contrib. 3=7632
- ionic crystals, exo-emission, review 3=19295
- from metal—oxide—metal sandwiches into vacuum 3=14660
- metal surfaces in gases, analyser, theory and design 3=418
- microscope, large-field, for thermionic research 3=2041
- particle, charged, induced, exo, as detection method 3=12229
- polymers, on tearing from base 3=24330
- steel, in vacuo 3=5690
- surface ioniz. of KCl on W and Ta 3=5632
- from thin film cold cathodes 3=12230
- vacuum cathodes, anti-emission materials 3=9523
- X-ray induced, exo, as detection method 3=12229
- Al foil, stretched, exo, photo-stimulated 3=7627
- Al—Al₂O₃—Al tunnel cathodes, energy distrib., retarding, field meas. 3=19301
- CaO, thermostimulated emission 3=419
- CaSO₄, exoemission rel. to thermoluminescence 3=2013
- CaSO₄—Mn exoemission rel. to thermoluminescence 3=2013
- CdS, nonequilibrium, effect of illumination 3=16971
- CdSe, nonequilib. electrons 3=21853

Electron emission — contd

- CdTe, field emission 3=421
- CsCl, exoemission spectrum 3=14618
- Cu, chemoemission, rel. to oxidation and reduction up to 600°C 3=2012
- Cu, in vacuo 3=5690
- Ge, "hot" electron emission 3=2017
- Ge, hot electrons, rel. to hot current carriers 3=10791
- KCl, additively coloured, photoemission 3=24336
- KCl, exoemission spectrum 3=14618
- MgO, thermostimulated exoemission 3=419
- NaCl, exoemission spectrum 3=14618
- NaCl:Cu, meas. 3=18008
- RbCl, exoemission spectrum 3=14618
- Si, hot electrons, rel. to hot current carriers 3=10791
- Si, p—n junctions, high-energy 3=883
- Si p—n junctions, hot electron emission 3=13087
- SiC, p—n junctions, high-energy 3=883
- W crystals, photoelec. Schottky deviations 3=21863
- W, shadowing of electron-microscope specimens 3=11329
- W, thoriated, as arc cathode 3=9755
- ZnS:Cu, activated, exo-emission 3=956

field emission

- carbon-tantalum system 3=14622
 - cathode tip point in microscope, effect of shape 3=24369
 - cold electrodes in gases, induced, 197°–298°K 3=7628
 - effect of adsorbed metal-like molecules 3=8219
 - field emission in glow discharges 3=373
 - field, vacuum conditions for stable cathode 3=420
 - in magnetic field, in zero-temp. limit 3=16973
 - microscope, demountable 3=21888
 - microscope, for Rh, Ir single crystal tips obs. 3=12233
 - photometer, CdS 3=18960
 - preceding elec. breakdown in vacuum 3=21850
 - in rutile diodes 3=9846
 - semiconductors, energy distrib. rel. to effective mass 3=2014
 - from single vapour-grown whiskers 3=9829
 - spectrometer, for semiconducting solids 3=5691
 - Al—Al₂O₃—Au, meas. 3=4177
 - Au whiskers 3=9829
 - CdS, dark, temp. var. 15–500°C, annealed and embarded 3=19300
 - CdS, energy spectrum 3=21852
 - CdS, fine structure, rel. to optical props. 3=16972
 - CdS, thermally stimulated, 20–200°C 3=19299
 - Co on Ta 3=14623
 - Ge, etched, a.c. field effect, storage effect 3=21854
 - Ge, treated in Cs vapour, hot electrons 3=24331
 - Ir 3=21855
 - Ir single crystal tips, obs. by microscope 3=12233
 - K, in whisker growth from vapour 3=3276
 - Ni, surface migration processes 3=7629
 - Pb—Al₂O₃—Pb structures, Schottky emission 3=9828
 - Pt whiskers 3=9829
 - Rh single crystal tips, obs. by microscope 3=12233
 - Si 3=24332
 - Si, direct meas. of energy 3=4176
 - Si, energy distrib. of electrons, band gap. 3=8509
 - Si p—n junction 3=14621
 - Si, strong p-type, energy distrib. 3=12232
 - Si tips 3=12231
 - SiO₂ + C 3=21851
 - W, adsorption and desorption of Ge 3=8928
 - W, energy distrib. 3=12232
 - W, microscopy, gas adsorption study 3=13568
 - W, prior to destruction, by high-density autoelectronic current pulses 3=7630
 - W, 10⁻¹⁸–0.1A, rel. to crystallog. directions 3=14620
 - W-tip cathode, build-up phenomena, study 3=19298
 - W tip in ultra-high vacuum 3=12228
- secondary**
- alkali halides, bomb. with K ions 3=5723
 - alkali halides rel. to optical absorption band transitions 3=22694
 - cathode-ray tube screens, beam modulation applications 3=24351
 - and discharges, electric, insulator surface 3=19226
 - discharges, h.f. l.p. 3=14551

Electron emission — contd**secondary — contd**

- energy and angular distrib. of secondary electrons 3=2022
 energy and angular distribution, criticism of Guba's work 3=7639
 energy distrib. meas. by retarding field method 3=2023
 graphite, pyrolytic, cleaved in vacuum 3=9841
 image intensifier tube, "multipactor" type 3=19325
 insulators, free from surface charge disturb. 3=9845
 insulators, meas. by low-noise ballistic impulse amplifier 3=14635
 by ions, in emission micr., sputtering 3=14642
 metals, due to H^+ , H , He^+ , He , calc. 3=7638
 metals, free electron model 3=4184
 metals, on electron bombardment, energy distrib. 3=12240
 by metals, photon irradi., 35-1250 keV 3=14831
 microprobe Castaing 3=7637
 microscope, contamination removal by ions 3=9864
 multiplier with Venetian-blind cathode 3=24341
 multipliers, efficiency meas. without flux meas. 3=14640
 photographic film dosimetry, use in 3=14831
 polar crystals, escape mechanism, theory 3=2021
 by positive ions on metal surfaces, distribution function 3=12239
 by rare gas ions, 1-10 keV, meas. method 3=9843
 resonance mechanism in decimetre wave range 3=428
 resonance process, in h.f. discharge breakdown 3=24264
 spectrum calc. for boundary layers 3=24345
 suppression, by covering surface by small cylinders, calc. 3=7636
 theory 3=19321
 Ag, rel. to temp., 20° to 450°C 3=427
 Al, γ -ray irradi., slowing-down spectrum 3=24345
 Al thick targets, bombarded by 1 Mev protons 3=24344
 Al-Mg alloys, effect of rare-earth admixtures 3=24342
 Al, by relativistic primary electrons, meas. 3=16979
 Al, by Ar^+ at 0.5-10.0 keV 3=9843
 Au thick targets, bombarded by 1 MeV protons 3=24344
 Be thick targets, bombarded by 1 MeV protons 3=24344
 BeO layers 3=24337
 C, by relativistic primary electrons, meas. 3=16979
 CsCl, by K ions, 40-7000 eV 3=16978
 Cu, by 0.5-10.0 keV rare gas ions 3=9843
 Cu, for 3 crystal planes, by Ar^+ ions 3=9844
 Cu, rel. to temp., 20° to 450°C 3=427
 Cu thick targets, bombarded by 1 MeV protons 3=24344
 Cu-Be electron multiplier as detector of weak ion currents 3=454
 Cu, by H_1^+ , H_2^+ , H_3^+ ions at 1-30 keV 3=24347
 Ge, energy distrib. of electrons 3=2023
 H_2 , by 50-100 keV protons, cross-section 3=14641
 H_2 gas, bombarded by 100 keV protons 3=19177
 He gas, bombarded by 100 keV protons 3=19177
 KBr, by K ions, 40-7000 eV 3=16978
 KBr, emission region thickness and efficiency 3=19323
 KCl, emission region thickness and efficiency 3=19323
 LiF, by K ions, 40-7000 eV 3=16978
 MgO, rel. to elec. cond. and work function 3=14637
 MgO, substrate material effect 3=19322
 Mo, by Ar atoms and ions 3=9842
 Mo, by H_1^+ , H_2^+ , H_3^+ ions at 1-30 keV 3=24347
 Mo, due to He^+ and Ar^+ , 0.1-2.5 keV 3=4185
 Mo, on electron bombardment at 100-1000 eV, energy distrib. 3=12240
 Mo, 0.5-10.0 keV rare gas ions 3=9843
 NaCl, by K ions, 40-7000 eV 3=16978
 NaCl, emission region thickness and efficiency 3=19323
 NaF, by K ions, 40-7000 eV 3=16978
 Ni, by Ar^+ at 0.5-10.0 keV 3=9843
 Ni, by H_1^+ , H_2^+ , H_3^+ ions at 1-30 keV 3=24347
 Ni, by relativistic primary electrons, meas. 3=16979
 Pb foil, X-irrad., 320 kV 3=12241
 Sb_2S_3 , secondary emission and inelastic reflection 3=14636
 Sb_2Se_3 , secondary emission and inelastic reflection 3=14636
 Sb_2Te_3 , secondary emission and inelastic reflection 3=14636

Electron emission — contd**secondary — contd**

- Si, by K ions, 40-7000 eV 3=16978
 Ta, by Ar^+ at 0.5-10.0 keV 3=9843
 Ta by He^+ bombardment 3=21862
 Ta, in presence of thermal emission current 3=24343
 Ta, on electron bombardment at 100-1000 eV, energy distrib. 3=12240
 Ta thick targets, bombarded by 1 Mev protons 3=24344
 Ti, effect of absorbed gases on proton induced emission 3=4183
 W, by H_1^+ , H_2^+ , H_3^+ ions at 1-30 keV 3=24347
 W, by positive ion bombard. 3=24346
 W, due to He^+ , model of two processes 3=4182
 W, in presence of thermal emission current 3=24343
 W, 1-206 eV meas. 3=7645
 Y_2O_3 , in presence of thermal emission current 3=24343
 Zr, by Ar^+ at 0.5-10.0 keV 3=9843
- Electron gas**
 See also Metals, theory; Plasma; Solids, theory; Superconductivity.
 band energy spectrum in strong elec. fld., optical characteristics 3=782
 Bloch's transport eqn., quantum theory 3=9366
 collision integral, allowing for polarization 3=3770
 collision integral, in terms of elec. polarizability 3=5381
 cyclotron radiation, with two-dim. Maxwell distrib. 3=12112
 cyclotron resonance in varying magnetic field 3=2776
 degenerate, response function 3=9367
 de Haas-van Alphen effect, Thomas-Fermi theory 3=697
 dense, correl. energy, perturbation calc. 3=21768
 density oscillations, long range, at non-zero temp. 3=9371
 dielectric behaviour, correlation effects 3=73
 dielectric const. of degenerate gas, corrected 3=7146
 dynamical and statistical correlations 3=10635
 elec. conductivity, transverse, zero-freq. limit 3=4848
 electric field fluctuations, turbulent 3=24310
 exchange energy in periodic potential 3=15474
 excitations, single-particle, in dense gas containing positive point charge 3=5386
 Fermi energy, size effect 3=2770
 free, properties rel. to size 3=15475
 Gaunt factors, nonrelativistic bremsstrahlung 3=1969
 higher random-phase approximations 3=16553
 interacting, renormalization const. 3=20147
 interaction, ground state, trial wave-function 3=14066
 lattice of positive charges, spin paramag. 3=8381
 magnetism, dia- and para-, of free gas 3=3769
 metal films plasma resonance absorpt. 3=10634
 metal plate, theory of apparent resistivity 3=13039
 metals, effect of Coulomb correl. 3=15466
 metals, effective mass inequality rel. to low-density carrier current 3=2773
 metals, effective mass inequality rel. to low-density carrier current 3=8408
 metals, e.m. wave extinction theorem 3=17049
 in metals, Fermi theory of interactions 3=3766
 metals, hot electrons and holes, range 3=20146
 metals, plasmon oscills., surface, foil, dispersion calc., semi-classical hydrodynamic 3=22690
 metals, theory, review 3=12953
 non-degenerate; one-part. excitations 3=6502
 plasmons, analogy with vector boson theory 3=9368
 in positive-ion lattice, ground state energy 3=25260
 quantum-mech. ring sum with Boltzmann statistics 3=5374
 quantum statistics, i.r. divergencies 3=7149
 radial distrib. function, asymptotic behaviour 3=11722
 radial distrib. function, classical, calc. methods 3=21261
 relativistic, degenerate, dielec. formulation of quasi-boson approx. 3=1634
 self-consistent field and dielec. formulations 3=14050
 semiconductors, nonpolar, elec. dipole scatt. 3=2872
 semiconductors, rel. to magnetoelec. effects 3=6576
 single-determinant wavefunctions, spin-component
 skin effect, in mag. fld. at low temp. 3=2778
 specific heat at intermediate density, calc. 3=753
 spin density waves 3=2772
 transport coeffs., Green function method 3=21759

Electron gas — contd

- transport eqn. in fields varying in space and time 3=22886
- transport theory, in electric, magnetic and phonon fields 3=10632
- Bi, correl. function, from cyclotron resonance 3=6507
- InSb, diffusion coeff. rel. to mobility 3=13074

Electron lenses

- See also Electron microscopes; Electron optics.
- coaxial two-cylinder, approx. formulae 3=9861
- field config., calc. 3=2028
- spherical aberration, rel. to conjugate positions 3=21878
- two-cylinder, coaxial, relativistic and non-rel. cases 3=19346
- Wien filter, use as monochromator 3=4195

electrostatic

- with disturbed axial symmetry, field calc. 3=21877
- experiments to examine Timm's theory 3=16984
- focusing system, with conical section focus 3=24362
- immersion lens, 2 charged semi-inf. cylinders 3=21876
- immersion objective, 4-electrode, for emission microscope 3=5710
- lens filters, aberration 3=19345
- quadrupole lens, autom. trajectory tracing 3=442
- two-cylinder equidiameter lenses, focal constants, calc. 3=14656
- two-cylinder, focusing and primary computation 3=19344

magnetic

- achromatization in multiple-lens microscope 3=2031
- astigmatism properties 3=21879
- e.m. lenses, axial field, analytic expression 3=4197
- helical quadrupole, transfer matrix 3=12249
- long lenses, focusing props. 3=14673-4
- magnetic circuits using Fe or Mo Permalloy 3=2037
- objective, modified for specimen manipulation, elec. optical props. 3=25792
- permanent magnet, design characteristics 3=2032
- quadrupole lens, focusing props. 3=2027
- replacement for e.s. lens in EEM-50 (Soviet) microscope 3=2036
- stigmatizers, fixed, adjustment 3=24364
- stigmator, e.m., theory and expt. 3=9860

Electron microscope examination of materials

- adsorption on transition metals, by field micr. 3=3369
- aerosols 3=13624
- applications in metallurgy 3=3377
- borosilicate glasses, granular structure 3=13545
- cathodes, oxide, dispenser, activation 3=19302
- crystal lattice imperfection images 3=800
- crystal lattice periods, images, information contents 3=1297
- crystal lattices, with small spacings, observation 3=1286
- crystalline materials, image contrast 3=1313
- crystals, images rel. to incoherent waves 3=1298
- crystals, 300 kV images, absorption and diffraction effects, observations 3=1285
- diamonds, types I and II, defects 3=2783
- dislocations and stacking faults, dynamical theory 3=10675
- dislocations, mixed type, diff. contrast theory 3=15495
- dislocations, sense of Burgers vector, meas. 3=803
- ear, inner, sensory hairs study 3=3657
- extinction contour shift by dislocations 3=16060
- fracture, by replica, etch-shadow extraction 3=16007
- ferromagnetic films, contrast effects at edges and cracks 3=13580
- ferromagnetics, stray fields on surfaces 3=1066
- field emission, W and Mo oxides, whiskers 3=3374
- graphite bromide, Br layer removal, in vacuo 3=20175
- mag. microfields on ferromagnetic surfaces 3=2075
- magnetoplumbite, mirror electron micrographs 3=13266
- metal films, X-ray emission 3=6902
- metals, b.c.c., anomalous contrast 3=11331
- metals, films, evaporated, surface structure, from replicas 3=13559
- mirror micrographs of domain structure 3=13266
- moonstone, crystal unmixing 3=20975
- nichrome, deformed, crystal dislocations, structure changes on heating 3=17747

Electron microscope examination of materials — contd

- polytetrafluorethylene, microstructure rel. to mech. props. 3=25800
- radiation damage by neutrons, Au, Cu 3=8939
- recent developments, review 3=1287
- replica systems, contrast improvement technique 3=18419
- silica replica films, structure 3=3375
- stainless steel, 300 kV 3=11334
- steel, by replica, Cr-C 3=18426
- steel (carbon), fatigue fracture surface 3=1244
- thermionic cathode surfaces, work function distrib. 3=2010
- ultramicrotome UMT-2, performance 3=3696
- whiskers of Mo and W oxides 3=3374
- whiskers, surface population det. 3=13581
- Al, creep fracture 3=8782
- Al, etching, striations, deform., impact 3=23534
- Al, oxidation, direct observation 3=11336
- Al single crystal 3=11334
- Al, slip, 350-400°C 3=22793
- Al-Ag films, stacking of layers 3=25803
- AlN, dislocations and wide stacking faults 3=4874
- Au films, fission fragment damage 3=22864
- Au films, X-ray emission 3=6903
- Au-1.5% Co, small ferromag. particles 3=1090
- Au-Si films 3=3354
- BaTiO₃, ferroelectric domain obs. 3=13113
- BaTiO₃, twinning, 2 types, hot C replica technique 3=18409
- C, black, particles, internal, and oxides 3=25804
- C replica films, structure 3=3375
- CaF₂, decomposition in microscope beam 3=21004
- CdS, surface texture studies 3=8924
- CdSe, films, crystal structure, on (110), (100) rocksalt faces 3=18378
- Co films, ferromagnetic domain wall movements 3=23168
- Co films, mirror electron micrographs 3=13266
- Co films, strip domain structure 3=20587
- Cu, films, dislocation changes, and polygonal crystal formation 3=15494
- Cu oxide whiskers, surface population det. 3=13581
- Cu-2.4% Co, small ferromag. particles 3=1090
- Cu, rolled, dislocations 3=15493
- Cu,Au superlattice, off-stoichiometric 3=13495
- Fe, α -phase, dislocation structure 3=4875
- Fe, analysis of dislocation networks 3=20200
- Fe, dislocation arrays, replica technique 3=17739
- Fe, dislocation images, by transmission 3=801
- α -Fe, neutron damage 3=8477
- Fe, slip, zone-melted, unusual 3=10678
- Fe-Sn, by replica, Cr-C 3=18426
- Ge, crystal dislocations 3=22784
- Ge, dislocations in torsional deformation 3=6514
- KCl, imperfections due to electron irradi. 3=2782
- Mg oxide, impurity precipitates 3=20169
- MgO, dislocations, sense of Burgers vector, meas. 3=803
- MgO, images, mean and anomalous absorption coeffs., meas. 3=1299
- MgO, plastically deformed, dislocation distribution 3=25283
- MgO smoke crystals, 300 kV 3=11334
- Mo, brittle cracks, nucleation on twin and grain boundaries 3=6803
- NaCl, surface treatment, disloc. processes 3=8785
- Nb, single crystals, dislocations 3=22780
- Ni, deformed, crystal dislocations, structure changes on heating 3=17747
- NiO, antiferromagnetic T-domain walls 3=20622
- n-PbS-p-PbO junctions films, in Resistor charge-storage tubes 3=25419
- PbS photovoltaic layers 3=3356
- Pt and Pt alloy shadowing, small-diameter evaporation source 3=18418
- Si abraded surfaces 3=3353
- Si, cracks, single crystals 3=23360
- Si, crystal dislocations 3=22784
- Si, tracks, prod. by neutron bombardment 3=15524
- Si-Fe crystals, deformation bands 3=8912
- SrF₂, decomposition in microscope beam 3=21004
- TiO₂, particles, melting effects 3=3925
- UAl₃, nuclear fission fragment damage 3=13015
- U-Mo two-phase alloys, thin film technique 3=5154

Electron microscope examination of materials — contd

- UO₂, irradiation defects 3=22847
- Zn, dislocation loops, diffr. contrast images 3=6525
- Zn, plastically deformed, dislocation loops 3=4873
- ZnAl, emission, effect of hydrocarbon layer 3=20973
- ZnS, dislocations and wide stacking faults 3=4874
- Zr, dislocations, arrangements, movement 3=10674
- ZrH₂, precipitation in Zr 3=11294
- 10⁶ V, principal results obtained 3=20953

Electron microscopes

See also Ion microscopes.

- aperture astigmatism, charge-induced, neutralization 3=19352
- contrast variation with aperture displacement 3=24367
- distortion-free operation 3=19351
- electron biprism interferences 3=21883
- electron gun, telefocal, oxide-cored cathode application 3=19362
- electron interference type, phase contrast 3=16151
- electron-optical bench at 20-50 A power 3=21886
- electrostatic mirror, image contrast 3=21887
- Elmiskop, tilting specimen-heating stage 3=25795
- EM-5 and EM-7 optics 3=2033
- EM-5 (USSR), resolution tests 3=11248
- emission, due to ions, sputtering effects 3=14642
- emission, electrostatic immersion objective, 4-electrode 3=5710
- emission, immersion objective lens 3=19354
- emission, large-field, for thermionic research 3=2041
- energy-selecting, results obtained 3=20954
- field, demountable 3=21888
- field emission, for Rh, Ir single crystal tips emission obs. 3=12233
- field emission, shape of cathode tip 3=24369
- heating stage, new 3=25793
- Hitachi-type HS-7, electron optical system 3=19355
- HU-11 A, improved, design features 3=20955
- image contrast, rel. to inelastic scattering 3=21885
- image distortion, simple correction 3=9862
- magnetic lenses, adjustment of stigmatizers 3=24364
- magnetostatic, lens design characteristics 3=2032
- magnification, det. and control 3=19358
- magnification, detm., error reduction 3=19357
- magnification, preselection gauge 3=4200
- mirror, for solid surface struct. 3=2034
- mirror, images of local surface charges 3=24368
- mirror microscope, symmetrical system with built-in camera 3=4199
- mirror, new, design features 3=25790
- modification for micro-diffraction studies 3=3372
- multiple-lens magnetic, achromatization 3=2031
- objective, astigmatism properties 3=21879
- objective lens, strong, condenser system 3=19361
- objective pole piece, for jem special obs. 3=25792
- Phillips EM 200, instrumental constns. 3=21882
- point cathode and resolution 3=19360
- power supply; resolution 5A 3=1911
- RCA-EMU3, specimen holder, semi-goniometric 3=25797
- reflection, low-energy 3=25791
- resolution limit, theory 3=19347
- resolving power, thermionic-emission microscopes 3=445
- scanning, brief account 3=22880
- scanning, construction and performance 3=2035
- secondary emission, contamination removal 3=9864
- Siemens Elmiskop I, heating-goniometer stage 3=25796
- Siemens Elmiskop I, magnification control 3=19359
- specimen holder, rotating, for Philips EM100 3=11332
- three-stage, with simultaneous microscopic image and diffraction pattern recording 3=443
- trajectory tracing by caustic and shadow image 3=24360
- transmission, high-temp. stage 3=25794
- UEM-100 (Soviet) microscope, modernization 3=2038
- "universal" emission 3=19356
- Zeiss EM9, stigmator 3=19353
- zone plate, for contrast increase 3=9863
- 300 kV, construction and use 3=11334
- 10⁶ V, construction and operation 3=19348
- 1-50 kV 3=24366
- 150 kV 3=19350

Electron microscopy

See also Crystal structure, atomic.

- alloys, f.c.c., stacking faults det. 3=12993
- amorphous films, electron scattering theory 3=9866
- anomalous absorption (Borrmann) effects, near low-order Bragg contours 3=20963
- autoradiographic technique 3=16439
- chemical and industrial applications 3=20961
- colour photography, for mass-thickness meas. 3=25799
- conference, inorg. and intermetallic crystals, Birmingham 1963 3=25683
- conference, Philadelphia (1962) 3=11327
- contamination prevention without beam damage to specimen 3=18412
- contrast thickness, rel. to objective aperture 3=21884
- crystals, moiré fringe patterns, dyn. theory 3=3376
- crystals, superposed parallel plate-shaped 3=25789
- dislocation networks, stereo-electron micrography 3=20193
- EMU-3 modification for ferromag. domain obs. 3=18415
- electron penetration rel. to accel. voltage 3=5155
- electron scatt., Born approx. applicability 3=16150
- emission, contrast reversal by polymeride layer 3=20973
- evaporation method without irradiating object to be coated 3=21178
- extraction replication, rapid improved method 3=18422
- filler examination, rubber etching 3=23528
- films, shadow-cast, prediction, expressions 3=18406
- foils, thin bent, thickness meas. 3=13583
- goniometer stage, precision type 3=8936
- goniometer stage, Valdrè-type, modification 3=8937
- high-voltage meas. techniques, improvement 3=20957
- high-voltage source, high regulation 3=1910
- Hitachi HU-11, tilting stage 3=18407
- image contrast, effect of electron absorpt. 3=25802
- image contrast theory, rel. to small-angle inelastic scattering 3=20964
- inelastic : elastic scattering cross-section ratio rel. to target 3=20974
- insulators, secondary emission, technique 3=9845
- liquid-helium cooled finger 3=24126
- metal and alloy sample preparation, by globule propulsion 3=18410
- metal foils, stresses, internal, diffraction contrast 3=20702
- metal foils study, special holder 3=20933
- metal microtome sections, structure 3=18425
- microelectrode production method, for detection of small quantities of substances 3=21016
- microprobe analysis, using electron beam scanning system 3=23532
- minerals, ultra-thin slices, investig. method 3=23533
- mirror microscopy, magnetic contrast 3=20970
- polymers, detachment replication technique, rel. to crystal structure 3=20967
- rational microtomy 3=18424
- replica prodn. of selected areas 3=25801
- replica technique for mag. surface microfields 3=2075
- replica technique for repeated examination 3=18428
- replicas envelope, produced without vacuum apparatus 3=18413
- replication, non-destructive, by Ni electrolytically deposited layer 3=25798
- scanning microanalyser, concentration mapping 3=3378
- selected area preparation 3=16148
- self-supporting specimens, by freezing technique 3=20968
- shadowing, high-resolution study 3=18416
- shadowing of specimens with W 3=11329
- specimen contamination, radiation damage 3=16149
- specimen damage by electron action 3=20971
- specimen freeze-drying and shadowing apparatus 3=23529
- specimen grids, improving wettability 3=20972
- specimen heating and temp. meas., -150° to 2200°C 3=25787
- specimen temperature rise 3=6904
- specimen thickness detm. 3=20969
- sputtering of film specimens in microscope 3=451
- "state-of-art" survey 3=21881
- stereomicroscopy, general theory 3=14657
- stretching device for specimens 3=18427
- support films, with holes, production method 3=13582
- surface replication techniques for loosely-bound particles 3=18423

Electron microscopy—contd

- surface texture, by specimen current image examination 3=23531
- thickness meas., iron foils, using domain structure 3=5400
- thinning of metals for electron microscopy, jet technique 3=11333
- tilting device for crystal films 3=18414
- tilting stage for Vickers microscope 3=8938
- voltage reference sources 3=20956
- wear machine 3=20762
- B films, prep. and props. as substrate material 3=18411
- C films prep. 3=16137
- Fe, cold worked, cellular structures within crystals 3=13521
- Fe—Si foils prep. from small specimens 3=11330
- W wire, metallography, using C replica technique 3=18421

Electron optics

- See also Beta-ray spectrometers; Electron lenses; Ion optics; Particle optics.
- aberrations 3=2029
- cathode-ray tubes, focusing, line 3=16983
- crystals, moiré fringe patterns, dyn. theory 3=3376
- defocusing, space-charge-controlled 3=441
- in electron tubes, brief review 3=5703
- electrostatic system, axially symmetric, rubber membrane analogue 3=21874
- focusing impure magnetic fields, time of flight and image rotation 3=14658
- focusing in mag. field proportional to r^{-1} 3=9865
- focusing props. of long mag. lenses 3=14673-4
- gun trajectory tracer, electrolytic tank and computer, including mag. fields and space charge 3=14655
- guns, Pierce, conical flow, anode aperture effect 3=4191
- image formation theory rel. to optics 3=440
- image transformations, similar to object 3=5704
- images, caustic and shadow, due to aberrations, meas. and compensation 3=4196
- "Intercol" system 3=19330
- ion focussing 3=21875
- lens, axis of symmetry, mag. induction, automatic curve tracer 3=19343
- lens system, reversibility of rays 3=19339
- light amplifiers, generator for linear and frame sweep 3=24361
- magnetic lens, long, focusing properties, Monte Carlo method 3=19342
- magnetic lenses, e.m. stigmator 3=9860
- magnetic mirror effect, demonstration 3=4194
- magnetic momentum defining non-interacting slit, high energies 3=19377
- magnetron trajectories 3=430
- paraxial trajectories in presence of space charge 3=9856
- probe systems 3=2030
- quadrupole optics, first and third order theory 3=19340
- review, rel. to electron microscopy 3=21881
- systems of two or four quadrupole lenses 3=24363
- trajectories in axial symmetric mag. field 3=9855
- trajectories, in inverted magnetrons 3=21870
- trajectories, in plane elec. fields, analyt. calc. 3=438
- trajectory tracing by caustic and shadow image 3=24360
- transaxial electrostatic systems, main properties, theory 3=19341
- Van de Graaff accelerator, electron gun 3=7644
- Wien filter, use as monochromator 3=4195
- zone plate, for microscope contract 3=9863

Electron pairs

- See also Positronium.
- alkali halides, positron long lifetime meas. 3=20148
- annihilation into 2 gravitons 3=7837
- collision, μ -e production 3=7878
- electron-positron interactions, high-energy, at Frascati 3=12447
- $e^+ + e^- \rightarrow \pi^+ + \pi^- + \pi^0$, overlapping resonances 3=17246
- production theory, not using Dirac "hole" 3=22112
- spectrometer, formation coeff. det. 3=14966

annihilation

- cyclohexane, solid, positron annihil., temp. var. 3=2774

Electron pairs—contd

annihilation—contd

- $e^- + e^+ \rightarrow \mu^- + \mu^+$ process 3=14967
- $e^+ + e^- \rightarrow 3\pi, 2\pi, \pi^0\gamma$, high-energy, virtual vector meson effects 3=17245
- in flight, rel. to γ -ray velocity constancy 3=22098
- in flight, 600 MeV, cross-section 3=7834
- in flight, 200 and 800 MeV 3=7836
- in metals, student meas. of Fermi energy 3=25263
- metals, theory and two-body correl. 3=8412
- into photon pair, radiative corrections to total cross-section 3=2251
- into $\pi^+ \pi^-$, $K^+ K^-$, $p\bar{p}$, $\pi^0 + \gamma$, cross-sections 3=2250
- positron annihil. in He atoms 3=2252
- production of (K, K^*) and (K, K^*) pairs 3=22195
- quantum electrodynamics check and elementary particle creation 3=24692
- rare earth metals, positron mean life meas. 3=17695
- 3-quantum, in condensed material, meas. of probability 3=24709
- to three pions, effects of multi-pion reson. 3=7833
- two-photon annihilation, polarized electrons and positrons, diff. cross-sections 3=24699
- Al_2O_3 , positronium formation and dynamics 3=25264
- Be, band structure 3=6503
- CuAu, Cu₃Au, ordered and unordered, radiation ang. distrib. 3=17694
- H₂, solid and liquid, time distrib. 3=17254
- He, solid and liquid, time distrib. 3=17254
- Hg, solid and liq., photons meas. 3=12954
- LiH, positron long lifetime meas. 3=20148
- Mg, band structure 3=6503
- N₂, solid and liquid, time distribution 3=17254
- Ni, Mn, ordered and unordered, radiation ang. distrib. 3=17694
- O₂, solid and liquid, time distrib. 3=17254
- Sc, positron mean life meas. 3=17695
- Y, positron mean life meas. 3=17695

production

- absolute cross-sections for 1 MeV γ -rays and 8 metals 3=12655
- direct, by cosmic-ray μ 3=22113
- direct, in Al by high-energy electrons, meas. 3=17255
- by electrons and muons of known energy 3=12446
- by extremely energetic cosmic-ray α -particle 3=6111
- by γ on nuclei, calc. 3=17257
- γ -ray absorpt. in crystals, coherence effects 3=7819
- h.f. region of spectrum, calc. 3=4374
- in multiple particle prod., e.m. process 3=19593
- μ -mesons, relativistic, energy loss rate 3=7882
- by ν -nuclei scatt. 3=7880
- opening angle rel. to cross-section, calc. 3=17258
- on p, high energies, calc. 3=17256
- and photons, polariz., meas., by asymmetry, in crystals, multi. GeV 3=17234
- from π with nucleons via γ 's, at 7GeV, in propane bubble chamber 3=7901
- π^- , 16 BeV in nuclear emulsions 3=24708
- in Si crystals 3=10101

Electron resonance

- See Cyclotron resonance; Paramagnetic resonance and relaxation.

Electron theory

- See also Quantum electrodynamics.
- bound electrons, magneto-ionic theory 3=17062
- dipole structure, rel. to electron-electron scatt. 3=5989
- Dirac-Lichnerowicz theory, use of Franz-Kofink formula 3=36
- Dirac many electron eqn. in Schrödinger—Pauli form 3=1632
- e.m. energy-tensor and wave eqn. deriv. 3=10030
- energy—momentum tensors, phys. equivalence 3=3711
- form factors, from high-energy scatt. expts. 3=22105
- inertial tensor, skew-symmetric, derivation of graviton 3=28
- Picht wave eqn., rel. to e.m. field 3=10089
- Poincaré compensating stresses in gen. relativity 3=1584
- relativistic spinning electron, quasi-classical theory 3=1585
- self-energy, in lowest order, calc. from quantum electrodynamics 3=24586

Electron theory — contd

- self-stress, covariance and classical electron 3=10087
- Sommerfeld, relativistic extension, for one-dimensional motion 3=14745
- transformation to muon on collision, e.m. theory 3=592

Electron tubes

- See also X-ray tubes.
- amplifiers, 3 kMc/s, low-noise 3=4187
- Cs diode, with electron and ion emitters 3=9848
- Cs diode, mag. field effect 3=19166
- camera, image-orthicon, Isocan scan, scatter signal 3=19324
- cathode-ray tube, figure of merit 3=9850
- cathode-ray tubes, focusing, line 3=16983
- c.r.t., as light source, pulsed, short, for meas, photo-multiplier resolution 3=9586
- cathode-ray tube, nuclear emulsion meas. 3=19328
- cathode ray, for nuclear track study 3=12242
- cathode-ray, screens, secondary emission, beam modulation applications 3=24351
- cathode-ray-tube, for time-interval meas. 3=9406
- cathodes, long, crossed-field 3=5699
- converters with Cs space charge compensation, two types 3=9714
- crossed-field devices, electron "temp". 3=14646
- diode, gas, space-charge-limited emission 3=21869
- diode, total emission 3=21867
- diode, vacuum, space-charge analysis, ions and electrons 3=21868
- diodes, for direct conversion of electricity 3=5618
- diodes, electron cyclotron resonance meas. 3=9851
- diodes, high-pres., space-charge limited current relation 3=19329
- diodes, rutile, tunnel field emission 3=9846
- diodes, space-charge instabilities 3=24348
- diodes, thermionic gas-filled, breakdown phenomena 3=2024
- diodes, thermionic, inert gas, elec. cond. after irradiat. 3=2026
- diodes, thermionic, inert gas, irradiated, negative resistance effects 3=2025
- electron gun, with temp.-limited cathode 3=432
- electron and ion oscills., low-voltage beam-controlled devices 3=14608
- electron optics in, brief review 3=5703
- focusing, electrostatic 3=5708
- focusing, gun, hollow-beam, high-convergence 3=5701
- focusing, magnetic, effect of transverse velocities 3=5706
- focusing, periodic, annular beams 3=5705
- focusing, periodic, field injection conditions 3=5707
- focusing, by r.f. fields on slow-wave circuit 3=5709
- g,—g, charact. display, 6BN6, circuit 3=21684
- gas diode, potential distrib., rel. to ion reflection 3=14509
- guns with curved trajectories, electrode shapes 3=24349
- Heliotron B cyclotron resonance, ion, frequency sweep detect. 3=24323
- ignitrons, triggering flash photolysis lamps 3=16759
- image converter, Sb—Cs cathode, dark emission? 3=9836
- image intensifier tube, "multipactor" type 3=19325
- klystron cavity gap r.f. voltage, meas., by retarding field technique 3=14645
- klystron, phase stabilization system 3=9926
- klystron, positive ion, 5 Mc/s 3=9876
- Klystron, protection circuit, filament voltage 3=24172
- klystron stabilizer, 10 kc/s Pound-type 3=14765
- klystrons and t.w. tubes, saturation problems 3=5698
- magnetron, cut-off curve, theory 3=14646
- magnetron, electron trajectory 3=430
- magnetrons, inverted, electron trajectories 3=21870
- magnetron, statistical theory 3=14647
- multiplier with Venetian-blind cathode 3=24341
- oscillographs, photographic recording 3=9852
- oscillographs, photographic recording 3=16980
- oscillograph, ultrahigh-speed pulse 3=1914
- Penning-type, space-charge effect on electron kinetics 3=21871
- Pierce emission systems, current density and transverse velocity meas. 3=4186
- plasma diode, Eichenbaum—Hernqvist model 3=9847
- plasma diode, kinetic theory for low plasma density 3=14511

Electron tubes — contd

- plasma diodes, cathode processes, as m.h.d. energy converter 3=21816
- Resistron charge-storage, impurity photo and tunnel conduction n—PbS—p—PbO films 3=25419
- secondary electron multiplier as detector of weak ion currents 3=454
- superopticon, for time sweep of rapid events 3=24352
- thyatron, gas, discharge extinction 3=4188
- transit-time mode in two-barrier devices 3=431
- travelling wave amplifiers, mechanical analogue demonstration 3=21191
- travelling wave, high power, bakeable magnet 3=9908
- triodes, Cs-filled, delay curves 3=2016
- Cs diode converter, efficiency analysis 3=3999
- W filaments, electrically heated, transient characts. 3=14627

Electrons

- This heading includes both negative and positive electrons when the differences between them are of no special significance. See also Beta rays; Cosmic rays, electrons; Crystals, electron states; Fluctuations, electrical; Nuclear reactions, electrons; Photoelectricity; Plasma; Positronium; Positrons; Space charge.
- accelerators, betatron, efficiency 3=21915
- accelerator, synchrotron, 1100 MeV, at Frascati, Italy 3=21912
- angular distribution function, in cascade 3=4488
- atmosphere, upper, precipitation 3=16237
- attachment processes in liquid Ar with O₂ and N₂ impurities 3=19175
- Auger, due to stopped π^- in emulsions 3=6038
- Auger, ejected from solid surfaces, apparatus for studying 3=14619
- Auger groups, K, rare earths, relative intensities 3=10468
- Auger, K—LL, calc. 3=8198
- Auger, K—LL probabilities, Z = 65 to 92, calc., relativistic effects 3=10467
- Auger, K, V⁵¹, Mn⁵⁵, Cu⁶⁴ and Ga⁷¹, and fluorescence coeffs. 3=7993
- auroral zone intense flux, 1000 km, 25 Sept. 1961 3=1472
- auroral zone precipitation accompanying ionospheric current systems 3=1473
- auroral zone, var. with solar activity; X-ray obs. 3=1471
- back diffusion in Na, H₂, Ar 3=5693
- betatron and synchrotron oscillations 3=5798
- bubble chambers, energy meas., length and sagitta 3=17249
- capture by α -particle passing through He atom 3=9720
- capture by fast protons in hydrogen 3=19952
- capture by He protons, calc. 3=367
- capture cross-sects. in Xe³⁴, ⁴¹—Ne colls. 3=5630
- charge difference with protons, expt. limits 3=10091
- in classical electrodynamics, field mass 3=21944
- classical theory, relativistic presentation 3=23749
- collision, e⁺—e[−], μ —e production 3=7878
- comparison with μ meson, by prod. in γ + p, high energy 3=22157
- Compton, double, differential cross-section, calc. 3=14935
- cosmic acceleration mechanism, Veksler, inadequacy 3=17361
- density meas., impedance meas. 3=12182
- depolarization in Møller and Bhabha scatt. 3=14960
- detection with emulsions 3=17252
- detector, scintillation, total absorpt., GeV region 3=10097
- diffusion in ion source 3=5716
- diffusion, in scattering gas 3=5820
- drift vel. at high elec. fields 3=19329
- drift velocity in hydrogen, nitrogen 3=9729
- drift velocity meas. 3=9736
- e—atom potl., scatt. phase shifts 3=7793
- e⁺ + e[−] → 3 π , 2 π , $\pi^0\gamma$, high-energy, virtual vector meson effects 3=17245
- e—polarized p collisions, high energy 3=12435
- electric dipole moment, upper limit 3=10092
- electromag. props. rel. to vector meson conversion decays 3=7827
- electron—ion—gas atom triple collisions, recombination 3=5627

Electrons — contd

- electron-photon showers, cascade theory, polarizing medium 3=12432
- exo-electrons, Geiger counter detector 3=4175
- free, e.m. wave incoherent scatt. 3=7702
- g-factor anomaly of free electrons, direct meas. 3=24691
- g factor, precision meas. on free electron 3=12441
- gravitational motion, geodesic departure, drag energy loss 3=18708
- He³ and He⁴ I, mobility, theory liquids 3=317
- Hg²⁰³ decay, conversion, transverse polarization 3=4603
- Hg²⁰³, transverse polar. of K and L-conversion electrons 3=10314
- high-energy physics, review lecture 3=14832
- history 3=5312
- intensity meas., 40-60 keV, by CdS conductivity effect 3=4198
- ionization loss, for relativistic electrons, radiation correction 3=7826
- in ionized gas, density from microwave scatt. 3=4136
- in ionosphere, eqn. of motion 3=6973
- ionosphere, upper, density profiles, top-side satellite sounder 3=16245
- knock-on, prodn. by fast μ -mesons 3=17300
- light scattering by free electrons, harmonics predicted 3=232
- low-energy, interactions, with water vapour and polar molecules 3=16902
- magnetic charge, determination 3=10090
- magnetic moment calc. by dispersion relations 3=2242
- mobility coeff. ratio with diffusion coeff. 3=4023
- momentum in metal, meas. method 3=6496
- μ -e, distinction between using multipion resonances 3=24771
- and μ , prop. similarities 3=17297
- polarization rel. to spectrum shape in β -decay theory 3=8029
- polarized, from ferromagnetic, on i.r. absorpt., possibility 3=12248
- reflection from Ge, forbidden 222 3=23440
- as Regge poles 3=22050
- storage rings, design 3=12267
- Stückelberg type, exact model 3=10088
- sun, corona, density, solution of van de Hulst's integral equations 3=18635
- transformation to muons on collisions, theory 3=592
- in transport process systematization 3=5392
- U photoelectrons, ang. distrib. 3=22366
- velocity selector, image force 3=4379
- velocity spectrograph, resolution improvement 3=12444
- waves, propagating, velocity modulation 3=16981

absorption

- See also Beta-rays, absorption.
- alkali halides, low-energy, coefficients 3=22694
- characteristic energy losses in metal films, meas. 3=5712
- crystals, diffraction after single plasmon loss 3=10641
- deep penetration, general theory 3=5711
- earth's atmosphere, energy dissipation calc. 3=23594
- energy loss spectra, meas. with electrostatic analyser 3=2039
- energy losses in 32 cpds., meas. and theory 3=2780
- metal films, anomalous transmission, low-energy 3=14660
- metals, b.c.c., anomalous absorption 3=11331
- metals, energy loss for fast nonrelativistic electrons, theory 3=4855
- phosphors, penetration depth of 10-80 keV electrons 3=10701
- slowing down at 20 MeV, bubble chamber meas. 3=24698
- solid, loss spectrum in transmission and reflection 3=20151
- solids, energy loss, rel. to u.v. props. 3=8578
- Al films, characteristic electron-energy losses 3=5712
- Al, 100-472 keV 3=14961
- Al-Cu alloys, characteristic energy losses 3=6508
- Cu films, characteristic electron-energy losses 3=5712
- Ge, asymmetry, rel. to surface plasma oscill. 3=20154
- Ge films, 50 keV, characteristic energy loss 3=14661
- in LiF (Cl, Br) energy losses of 30 kV beam 3=15478
- Mg-Al alloys, characteristic energy losses 3=6508
- MgO, inelastic scatt. effects 3=25802

Electrons — contd

absorption — contd

- MgO, mean and anomalous, by electron micrographic images 3=1299
- Pb, superconducting, capture lifetime 3=14450
- Si, asymmetry, rel. to surface plasma oscill. 3=20154
- Si films, 50 keV, characteristic energy loss 3=14661

ionization

- avalanche growth, cloud-chamber study 3=21711
- energy per ion 3=14522
- H₂, effects of electrons and positrons 3=2248
- H⁺ + H(1s) \rightarrow H(1s) + H⁺, cross-section 3=9726
- Ne⁺ to Ne²⁺, cross-section 3=21703

radiation

- See also Bremsstrahlung; Cherenkov radiation; Electrodynamics.
- accelerators, radiation damping 3=24394
- atomic, in alternating mag. field 3=17536
- betatron, var. with injection voltage 3=17007
- bremsstrahlung energy loss at 1 MeV, ang. depend. 3=17699
- cyclotron, effect of Coulomb interactions 3=7602
- cyclotron, electrons trapped in Jupiter's exosphere 3=11593
- cyclotron, resonance system, γ -rays meas. 3=24419
- cyclotron, with two-dim. Maxwell distrib. 3=12112
- discharge, PIG, electron gyrofreqn. harmonics 3=7465
- e.m. field, in uniform motion, rel. to wave eqn. 3=10089
- equation of motion, radiation damping 3=5819
- exosphere, cyclotron-generated noise 3=23606
- in gravitational motion, geodesic departure 3=18707
- ionized gas, Gaunt factors, nonrelativistic bremsstrahlung 3=1969
- Jupiter, cyclotron radiation from exosphere 3=3621
- motion in dielec. tube, Cherenkov radiation 3=24440
- neutrino pair emission by hot plasma, calc. 3=7824
- photon asymmetry for transversely polariz. electrons 3=4375
- photon "beat" generation process 3=7302
- in plasma cylindrical column, noise radiation and scattering 3=383
- plasma of discharge in mag. trap 3=7512
- plasma, hot, cyclotron radiation calc. 3=9786
- plasma, magnetoactive, moving in spiral 3=22106
- plasma, moving in helical path 3=24308
- plasmas, non-Maxwellian, microwave emission 3=5657
- plasma, relax. in mag. field 3=22107
- radiation damping theory, classical limit 3=7806
- synchrotron, in excitation of H atoms 3=11569-70
- synchrotron, 680 MeV, polarization properties 3=14954
- theta pinch before breakdown, X-rays 3=12179
- v.l.f. emission in ionosphere, energy det. 3=13700

scattering

- See also Atoms, electron scattering; Beta-rays, scattering.
- amorphous films, rel. to electron microscopy 3=9866
- in anisotropic media, effect on elec. resistance 3=25316
- atomic electrons, free and bound, and braking 3=22505
- by atoms, polarization, asymmetry in double scatt. 3=22499
- by diatomic molecular ions 3=22610
- on atoms, 50 keV, with polarization 3=22496
- in betatron, meas. of electron loss 3=459
- betatron, multiple processes in target 3=5983
- Born approx. in electron microscopy conditions 3=16150
- bremsstrahlung energy loss at 1 MeV, ang. depend. 3=17699
- conduction electrons in monovalent metal 3=8384
- Coulomb collisions, in polarizing medium 3=24371
- by Coulomb field, multiple, relativistic corrections 3=6363
- Coulomb, Regge poles and perturbation theory treatment 3=14891
- crystals, elastic, fast small-angle 3=13577
- crystals, elastic and inelastic intensity meas; Kikuchi lines 3=1302
- crystals, inelastic, electron excitation 3=15479
- crystals, small-angle inelastic, theory 3=4856
- by D, from D form factors, from impulse approx. 3=17353
- by d, dispersion theory, correction 3=17354

Electrons — contd

scattering — contd

- e + d → e + d + π^0 , dispersion theory 3=19671
- by deuterons, elastic, at small momentum transfer 3=5985
- deuterons, elastic, rel. to d form factor 3=2329
- on deuterons, inelastic, 620 and 350 MeV, neutron form factor 3=4397
- e—d, low momentum transfer, neutron form factors 3=19612
- d and \bar{p} , and form factors n and p 3=14971
- drift vel./diffusion coeff., swarm expts. 3=12251
- electromagnetic waves, at high energy 3=17057-8
- e—e, hard-photon radiation taken into account 3=24694
- electron—electron, high-energy, perturb. expansion 3=12390
- electron—electron, Möller, rel. to beam polarization meas. 3=19331
- electron—electron, rel. to dipole structure 3=5989
- γ —e, non-linearity intensity 3=19600
- e— γ , in plasma, rel. to kinetic props. 3=21782
- by photons, polarized, intense, from laser, obs. possibility 3=12448
- electron—photon showers, direct production from μ -meson interactions 3=14998
- in external field, with large momentum transfer 3=24696
- (e, e'p), quasi-free, in impulse approximation 3=19835
- e—proton, calc. 3=17301
- p and d, and form factors n and p 3=14971
- protons, dispersion theory analysis 3=2244
- p—e, energy depend. of form factors 3=17277
- e—p, enhancement, rel. to Regge trajectories 3=2207
- e—p, at high momentum transfer 3=14958
- e—p, inelastic, 3/2 reson. in isobaric model 3=19611
- e—p, i.r. singularities 3=5988
- e—p, quantum electrodynamics 3=17165
- e—p, rel. to dipole moments 3=14956
- e—p, small 4-momentum transfer, cross-section 3=12455
- e—p, statistical analysis 3=14957
- p—e, two-photon exchange contribution, calc. 3=17247
- e—p, 2-photon exchange, resonant enhancement 3=12442
- e—p, threshold behaviour, close-coupling effects 3=22502
- e—p, 1 and 4 BeV, Rosenbluth formula deviation search 3=19613
- films, calc. 3=20153
- by films, inelastic scattering 3=2781
- form factors from e—p scatt. analysis 3=14957
- free, in irradiated air, loss 3=14598
- γ -ray external conversion electrons, straggling in convertor 3=24676
- gases, momentum transfer cross-section 3=14199
- gases, use in density gauging 3=3820
- high-energy, with charge and mag. moment distrib. 3=22105
- high-energy, isospin selection rules 3=19837
- inelastic, in condensed media rel. to boson absorption 3=7828
- inert gases, Ramsauer min. rel. to props. in diodes 3=2025
- in ionospheric D-region, N₂ rotational excitation 3=3499
- by iron foils, magnetized 3=2042
- of light, in Van Allen belts 3=6996
- magnetic field in an impenetrable torus 3=19422
- metal films, background intensity calc. 3=4202
- metals, energy loss for fast nonrelativistic electrons, theory 3=4855
- metals, energy loss spectra, meas. 3=2040
- by molecules 3=15397
- by molecules, det. of electronic energy levels 3=4740
- Möller and Bhabha, depolarization 3=14960
- on μ -mesons, electrodynamic, rel. to mass splitting 3=5925
- μ -mesons, 8 GeV, meas. 3=10139
- multiple, in nitrogen, rel. to positrons 3=17248
- n bound in D, poss. inadequacies 3=4118
- nuclear E0 transitions, cross-sections 3=17454
- nuclear effective charge study 3=7971
- nuclear excitation, single-particle 3=24858
- nuclear giant resonance excitation 3=15181
- nuclear recoil in equivalent photon method 3=366

Electrons — contd

scattering — contd

- nuclear track emulsions, multiple, calc., by c.g. and sum method 3=24567
- by light nuclei, inelastic, mag. transitions 3=10332
- by nuclei, inelastic, partial-wave analysis, quadrupole excitations 3=665
- nuclei, light, magnetic elastic scatt. 3=4626
- nuclei, light, strong M1 transitions 3=12578
- nuclei, liquid drop model, partial wave analysis 3=8081
- on nuclei, non-coherent 3=2438
- nuclei, rel. to charge distrib.fluctuations 3=8080
- nuclei, rel. to nuclear pair correl-function and momentum distrib. 3=7964
- nuclei, relativistic, by Contour integr. 3=12656
- by nuclei, relativistic electrons 3=12657
- by nuclei, second Born approx. 3=8082
- nuclei, vibr. levels excitation, theory 3=7985
- nucleons, high-energy, use of Regge poles theory 3=5987
- on nucleons, π prod., theory 3=595
- by nucleons, scatt. amplitudes 3=10145
- one-pion exchange analysis, validity 3=4418
- phase shifts calc. for Thomas—Fermi potl. 3=22498
- in plasmas, Langmuir scattering 3=24268
- π -meson, high-energy, use of Regge poles theory 3=5987
- polaron—phonon, in polar crystals 3=4850
- polymers, π -electron excitation, by 20 keV electrons 3=22617
- positron—proton, rel. to two-photon exchange 3=2248
- by positrons, asymptotic radial depend., and positronium spectrum 3=10102
- on protons, elastic, in weak transfers, 100-250 MeV, cross-section 3=2243
- randomly distrib. centres, quantum statist. equil. 3=5380
- reflection coeff. for surface potl. barrier models 3=15471
- reflection from Cs-coated polycrystalline metals 3=21889
- relativistic Coulomb, theory 3=15180
- screened nuclei, relativistic electrons 3=22494
- on solids, diffusion model of back-scatt. 3=22108
- solids, energy distrib. for inelastic scatt., rel. to atomic number 3=14659
- of starlight, high energy photon prod.? 3=19723
- superconductors, interphase boundaries 3=24139
- Ag, background intensity calc. 3=4202
- Ag, backscatt., 60, 75, 100 keV, var. with angle and thickness 3=15182
- Ag, intermediate-image β -spectrometer 3=5986
- by Ag, 10 keV, back- and through-scatt. 3=12443
- Al, background intensity calc. 3=4202
- Al, backscatt., 60, 75, 100 keV, var. with angle and thickness 3=15182
- Al, characteristics energy losses 3=4858
- Al, dipole giant resonance 3=15181
- Al, energy loss 3=2040
- Al, intermediate-image β -spectrometer 3=5986
- by Al, 10 keV, back- and through-scatt. 3=12443
- Au, background intensity calc. 3=4202
- Au, backscatt., 60, 75, 100 keV, var. with angle and thickness 3=15182
- Au, double Mott scatt. 3=24925
- Au, double Mott scatt, 45-245 keV 3=24924
- by Au, 10 keV, back- and through-scatt. 3=12443
- Be⁹, inelastic, high-energy, analysis using three models 3=2437
- B^{10,11}, magnetic multipole transitions 3=4625
- Be⁹, magnetic multipole transitions 3=4625
- Be⁹, 60-250 MeV, inelastic 3=12580
- Bi²⁰⁹, elastic, 183 MeV, model 3=24926
- Bi²⁰⁹, 183-600 MeV, inelastic 3=10333
- on C, differential and total elastic and inelastic cross-sections 3=21890
- C, dipole giant resonance 3=15181
- C¹², and giant dipole reson. shell and collective models 3=19769
- C¹², inelastic, high-energy, analysis using three models 3=2437
- C¹², inelastic, single particle excit. theory 3=24858
- C¹², magnetic multipole transitions 3=4625
- Ca⁴⁰, cross-sections using Brueckner charge density 3=22367

Electrons — contd**scattering — contd**

- in Cs plasma, weakly ionized 3=12186
- Cu and Cu alloys, by stacking faults 3=22795
- Cu, intermediate-image β -spectrometer 3=5986
- Cu⁸³, 183-600 MeV, inelastic 3=10333
- Fe, energy loss, rel. to phase transf. 3=2040
- Ge, cleavage surfaces, energy loss 3=4857
- H and D, rel. to nucleon electric structr. 3=4381
- H atoms, inelastic, degeneracy effects 3=4721
- by H atoms, spin exchange 3=15299
- H-e system, ¹S state, resonance levels 3=22504
- on He atoms, resonance in elastic scattering 3=15300
- He, high-energy, use of Regge poles theory 3=5987
- He³, compared with T 3=25065
- He³, elastic, form factor analysis 3=24695
- He gas, elastic and optical transitions 3=25066
- He⁴, rel. to electron elec. dipole moment 3=10092
- He³, structure and form factors 3=17357
- by Hg atoms, 1-2 keV, polarization 3=12780
- In¹¹⁵, 183-600 MeV, inelastic 3=10333
- InSb, rel. to temperature and degrees of degeneracy 3=10820
- Kr, dipole giant resonance 3=15181
- Li⁶ excitation 3=22368
- Li⁷ excitation, form factors, comparison with theory 3=19766
- Li⁷, inelastic, excitation cross-sections 3=10240
- Mo, energy loss 3=2040
- N¹⁴, magnetic multipole transitions 3=4625
- Nb, energy loss 3=2040
- Ni, energy loss 3=2040
- by O¹⁶, giant resonance 3=19836
- O¹⁶, inelastic, E1 transitions, evidence 3=4627
- O¹⁶, inelastic, peaks, rel. to electron transitions 3=24927
- O¹⁶, magnetic multipole transitions 3=4625
- O¹⁶, inelastic, excitation cross-sections 3=10240
- O¹⁸, monopole, elastic and inelastic 3=10331
- Pb, energy loss 3=2040
- Pb, intermediate-image β -spectrometer 3=5986
- Pb²⁰⁸, 183-600 MeV, inelastic 3=10333
- S³², monopole, elastic and inelastic 3=10331
- SF₆, formation, energy depend. 3=12068
- Si, cleavage surfaces, energy loss 3=4857
- Si²⁸, magnetic multipole transitions 3=4625
- Sn, backscatt., 60, 75, 100 keV, var. with angle and thickness 3=15182
- T, compared with He³ 3=25065
- Ta, energy loss 3=2040
- Ta¹⁸¹, 183-600 MeV, inelastic 3=10333
- Ti, energy loss, rel. to phase transf. 3=2040
- V⁵¹, inelastic, 183-600 MeV, cross-section, calc. and meas. 3=664
- W, elastic refl. coeff., 1-206 eV meas. 3=7645

Electro-optical effects

See also Electroluminescence; Optical constants.

- acetylene acid, and D-substitution product, parameters 3=15366
- condensed media, in critical region 3=21371
- conduction-electron light absorption, elec. field depend. 3=4967
- cubic crystals, light modulation 3=23050
- dye—polyelectrolyte complex, colour change by elec. field 3=3804
- ethylene, and D-substitution product, parameters 3=15366
- frequency shifting, in crystal, by Pockels effect 3=5536
- gases, with non-rigid mols., elec. birefringence. 3=174
- hexamethylenetetramine, advantages 3=23049
- hydrocyanic acid, and D-substitution product, parameters 3=15366
- Kerr effect, in i.r. beam modulation 3=1809
- Kerr effect, macromols., enzyme action 3=23537
- Kerr, use in voltage pulse meas. system 3=12044
- liquids, electrical birefringence, absolute retardation ratio detm. 3=11802
- macromolecule solutions, Kerr effect 3=4792
- macromolecules, Kerr effect rel. to relaxation time measurement 3=8319

Electro-optical effects — contd

- multicomponent systems, mol. Kerr effect 3=7249
- pentaerythritol crystals 3=23048
- photoelectrets, electrophotographic process 3=15622
- photographic image, latent, photoconductors 3=17908
- polymers of $(-\text{CR}_2^{(1)}-\text{CR}_2^{(2)})_n$ type, Kerr constant 3=5437
- rectification, optical, in crystals, with sufficiently low symmetry 3=5537
- solids, absorption in elec. field 3=13160
- solids, nonlinear, energy considerations 3=13155
- water-filled Kerr cell, props. 3=24015
- CdS, electrical Kerr pot. distrib., i.r. effects 3=17872
- CdS, study of current and field inhomogeneities 3=2905
- GaAs, 900 kc/s 3=23051
- KH₂PO₄, modulation at microwave freqn. 3=5535
- KD₂PO₄, zero-stress coeff. 3=17943
- KTaO₃, 4.2° to 77° K 3=17936
- ZnS, absorption edge shift rel. to field 3=6655
- ZnS phosphors, photodielec. effect 3=13105
- ZnSe 3=15657

Electrophoresis

- cataphoretic study of d.c. discharges 3=9734
- inert gases, press. depend., and ionization mechanisms 3=14513
- ink, electromagnetophoresis, and chemical analysis 3=16901
- interfacial phenomena, a.c. methods 3=12065
- ion velocity detm. by Bogolyubov distrib. functs. 3=3399
- petrol, electromagnetophoresis 3=16901
- separation and analysis techniques 3=16171
- symmetrical electrolyte, theory 3=20999
- vaseline, electromagnetophoresis 3=16901
- CuSO₄, electromagnetophoresis 3=16901

Electrostatics

- See also Electrets; Electric charge; Electric fields.
- axial figures, Coulomb self-energy calc. 3=21689
- capacitance-coaxial circ. loops 3=19159
- condenser, circular plate, at small separations 3=3994
- conducting droplet under action of surface tension and e.s. forces 3=14503
- Coulomb energy, multipole expansion 3=12059
- cylinder, hollow conducting, boundary problems 3=14505-6
- dispersion relations analogy 3=19419
- Earnshaw's theorem, generalization 3=14504
- elec. fields in conducting half-space 3=21690
- energy, macroscopic; microscopic basis 3=2089
- field bet. parallel plates, teaching meas. 3=14502
- force on conducting sphere in parallel-plate condenser 3=1924
- gases, elec. precipitation, dust space charge 3=24202
- generator, fluid to transport charge 3=14507
- half-space, potl. of direct-current point source 3=9005
- interfacial phenomena, a.c. methods 3=12065
- liquids, drops falling under gravity, potential 3=355
- liquids, electrohydrostatic pressure distrib. 3=9479
- potential, flux, due to linear charge distrib. 3=1923
- potential near infinite line charge distrib. 3=3989
- satellites, artificial, drag, controversy discussion 3=11612
- spheroid, charged, in conducting cylinder 3=16897
- voltmeter, electrostatic, surface potl., meas. 3=7419

Electrostriction

See also Piezoelectricity.

- determination-method 3=11802
- insulating crystals, rel. to microscopic props. of lattice theory 3=25413
- Rochelle salt, near upper Curie point 3=13121
- Si tips, at electron emission, field, cathode 3=12231
- SrTiO₃, meas. 3=8562

Elementary particles

See Fundamental particles.

Elements

- Cm, possible natural existence 3=19825
 - non-transition, multivalent, lattice vacancies resistivity 3=4903
 - tables of props. 3=2146
 - transuranic, review 3=4284
- origin**
- See also Cosmology; Thermonuclear reactions.
 - Heavier than Ca, synthesis mechanism 3=15185
 - near Pt, fusion processes in supernovae 3=6318

Elements — contd**origin — contd**

and Sm neutron capture, 30 keV 3=10354

relative abundances

initial 3=16324

in lunar crust 3=3546

metals, in stars, deficiency in population II 3=13908

neutron numbers 98, 108, 116, importance 3=12751

stars, magnetic, surface 3=11564

in stars, synthesis by neutron capture 3=21113

B and B¹¹/B¹⁰ ratio, in meteorites and in earth 3=13876

Be in solar atmosphere 3=13881

U²³⁴/U²³⁸ disequilibrium, and pleistocene dating 3=13647U and Th from primordial Pb²⁰⁶/Pb²⁰⁷ ratio 3=25971**Emissivity**

absorbing materials, selective, meas. using i.r. spectrometer 3=9598

cathodes, SrO, on O—Ni base, var. with thickness 3=20440

Inconel, total hemispherical emittance 3=289

isothermal cavities 3=24101

metal wires, thin, rel. to plasma props. 3=13159

metals filaments, meas. by controlled flash heating 3=7379

metals, hemispherical, meas. using strip sample 3=3919

metals, i.r., spectral, mea. method 3=292

metals, thermal, rel. to optical constants of surface 3=286

Planck's calc., including absorpt. 3=9653

radiation by diffuse conical cavities 3=14410

spectral, relation to other optical props. 3=25432

stainless steel types 321 and 430 3=289

Ag wire, meas. down to 2000 A diam. 3=13159

Au, spectral, 4-13μ, 550°-1000°K 3=292

CO₂ at 1200°K, statistical model 3=5467

Ni, thermal emissive power 3=286

Ni—Cr alloys, effect of C absorption 3=3347

Ni—Cr—Fe alloys, effect of C absorption 3=3347

Pt and Pt—Rh wires, 100°-1000°K 3=24100

Th, carbide—iodide, at high temps. 3=23378

U surfaces, polished and oxidized 3=14413

Emulsions

See also Colloids.

attenuation of sound 3=14261

disperse systems, ionization equilibrium 3=21696

nitrobenzene—water, dielec. props. 3=3414

oil—water, dielec. props. 3=3414

stability to ultracentrifugation, rel. to c.m.c. 3=6937

for supercooling of dispersed liquids 3=16837

water-in-oil, agglomeration, from dielectric consts., shear and rest 3=13621

water—oil, dielec. props. 3=3414

Emulsions, nuclear

See Nuclear track emulsions.

Energy levels

See Atoms, structure; Molecules; Nucleus, energy levels; Spectra.

Entropy

See also Thermodynamics.

Carathéodory's theorem, rel. to stable steady state 3=1878

correlated systems forming isolated system 3=11707

crystal lattice statistics, 7 models 3=12910

e.m. wave, by quantum statistics 3=484

excess, of mixing, in metallic soln. systems 3=8885

ferro—antiferromagnetic transitions, entropy change 3=15750

gas—radiation, matter radiation systems, entropy balance 3=14429

Gibbs theorem, and paradox 3=21442

glassy state, zero-point 3=11304

liquids and dense gases, hole theory 3=18800

perfect gas with Eutherland viscosity, variation in shock 3=11854

production and reln. to transport problems 3=23780

solids, magnetic spin resonance, minimum production 3=23222

solvation 3=9452

spin operators, increase with time 3=61

suspensions, diffusion and viscosity 3=8984

system of almost indistinguishable components by statistical mechanics 3=18738

Entropy — contd

transonic flow, adiabatic, energy

dissipation. 3=163

and uncertainty principle 3=14036

vaporization and condensation, theory 3=19070

properties of substances

alkali halides, Debye temps., temp. depend. 3=22667

benzene, Debye approx. 3=15440

hexamethylenetetramine, Debye approx. 3=15440

naphthalene, Debye approx. 3=15440

polymer films, gas diffusion, linear free-energy relationship 3=2821

polypropylene, atactic and isotactic, rel. to structure 3=10597

Ag₂O, 2° - 80°K, rel. to particle size 3=769

Ar adsorption on graphitized carbon black 3=11324

(BOCl)₃ 3=23538

Cu—Ag alloys, vibrational, of Ag 3=12922

Cu—K sulphate, spin system, thermodynamic properties 3=20109

H₂ and D₂, -175°C to 150°C, up to 2500 atm 3=23930He³, liq., 0.015°-0.3°K meas. 3=12016

He II, liq., entropy prod. and heat flow 3=21641

He³, liquid, 0.054 - 0.3°K 3=5564He⁴, solid, rel. to equil. with liq. He⁴II 3=1888Hg₂SO₄, 15°-300°K, meas. 3=6477KNO₃, fusion 3=21617LiNO₃, fusion 3=21617NaNO₃, fusion 3=21617SF₄, 100° to 1500°K 3=21445SiF₄, from 15°K to triple point 3=21636SOF₂, 100° to 1500°K 3=21445**Epitaxy**

See Crystals, faces; Crystals, growth; Films, solid.

Equations

See also Differential equations; Integral equations.

Boltzmann, mathematical props. 3=13996

diffusion, many-region, time-dependent, simplification 3=5546

Liouville, for system in contact with a reservoir 3=69

magnetic resonance, operator techniques 3=11120

Equations of state

See also Thermodynamics.

charged particle system classical, high temp., low density 3=21258

elements at very high pressures, from Thomas—Fermi—Dirac atom theory 3=775

Fermi—Dirac gas, heuristic approx. 3=7143

hard sphere mol. mixtures, Monte Carlo calc. 3=23925

hard spheres, compressibility and pressure eqns. 3=23924

one-dimensional system with attractive potential 3=65

plasma, classical, high temp., low density 3=21258

plasma, Debye-type 3=14566

plasma, metallic, gaseous 3=16927

polymer linear monolayers 3=11310

simple molecular structure, reduced state correlation between Enskog modulus and reduced press. and temp. 3=14036

stars, ionization equilibrium 3=16401

superdense matter, Chandrasekhar's mass limit 3=19924

gases

Boyle's-law gas, internal energy, sp. hts. 3=11831

compressibility factors, derivative, two new 3=11826

corresponding states law 3=21433

density fluctuations, dilute gas 3=14209

1, 2-difluorobenzene 3=8291

fourth virial coefft., limits w.r.t. temp. 3=18848

fourth virial coefft. for square-mound potential 3=1721

hard-sphere repulsive potl s. 3=11825

hard-sphere gas, Percus—Yevick virial coefficients 3=11723

at high temperatures 3=11824

hyper-chain eqn., hard-sphere gas 3=18845

inert gases, third virial coeff. and three-body forces 3=167

mixed hydrocarbon vapours, 2nd virial coeffs 3=14205

naphthalene vapour-inert gas mixtures 3=304

nitrogen, and velocity, acoustic waves 3=7242

Equations of state — contd

gases — contd

- polar, second virial coeffs., contribs. of off centre dipoles, new mol. model 3=14204
- quantum hard-sphere cell model 3=21434
- real gases 3=9496
- second virial coeff., new equation, and Joule-Thomson data 3=14211
- theoretical survey, statistics 3=20116
- vapour pressure, non-linear const. determ., graphical 3=14421
- virial coeffs. for hard lines, squares and cubes 3=7145
- virial coeffs., and intermolecular forces, organic compounds 3=25154
- virial coeffs. for square-well potentials 3=25153
- virial coeffs., temp. extrapolation 3=7234
- H₂, used to calc. D₂ thermodynamic props. 3=23929
- He⁴, third virial coeff., quantum calc. 3=14206
- He-H, vapour-liquid equilb. and temp. corr. 3=24112
- He-N₂ system, 2nd virial coeff., 175-475°C up to 100 atm 3=14192
- Hg vapour 3=5464
- Kr 3=9494

liquids

- binary mixtures 3=9451
- electrolyte, two-dimensional 3=18452
- electrolytes, classical, high temp., low density 3=21258
- extended hole theory calc. 3=11782
- liquids, reduced density-temp. reln. 3=130
- methane, at low temp., up to 300 kg cm⁻² 3=18801
- polyelectrolytes, second virial coeff. 3=21347
- polymethylmethacrylate solns., second virial coeff. 3=134
- polystyrene solns., second virial coeff. calc. 3=16615
- repulsion law, polar liquids 3=3795
- water, from detonation pressure meas. 3=1751
- Ar, at low temp. up to 300 kg cm⁻² 3=18801
- A, at 90°K, second virial coeff. 3=132
- H isotopes, universal, including quantum effects 3=21321
- He isotopes, universal, including quantum effects 3=21321
- N₂, at 90°K, second virial coeff. 3=132
- Ne-PH₂, phase separation, 0.95-86% Ne, 24.56°K 3=23871
- O₂, at 90°K, second virial coeff. 3=132

solids

- Birch correction factor, generalized to arbitrary temp. 3=6463
- crystal at zero temp. 3=6449
- crystals, ionic, from alkali halide shock compressibility 3=18179
- f.c.c. and two-dim. square lattices 3=25204
- graphite, pyrolytic, Hugoniot eqn. up to 300 kbars 3=10608
- metals, calc. using Rydberg potential 3=4800
- metals and plastics, mechanical-chem. eqn. 3=8761
- noble metals, rel. to shock wave compression data 3=22670
- stishovite 3=17666
- theoretical survey, statistics 3=20116
- Ag, from closed-shell repulsive potential 3=4828
- 6061-T6 Al, low pressures 3=17667
- Al, rel. to spec. ht. and Gruneisen coeff. change 3=6787
- Ar, Lennard-Jones, and Devonshire applicability 3=20117
- CsBr, calc., by sums in wave-vector space 3=20115
- Cu, rel. to spec. ht. and Gruneisen coeff. change 3=6787
- Cu-Sb alloy, mechanical eqn. of state 3=6870
- Fe, quantum mech. derivation 3=8373
- Fe, at 10⁴ atmosphere 3=8372
- H isotopes, universal, including quantum effects 3=21321
- He isotopes, universal, including quantum effects 3=21321
- He³, α -phase, from specific heat meas. 3=1887
- KBr, calc., by sums in wave-vector space 3=20115
- KCl, calc., by sums in wave-vector space 3=20115
- NaCl, accounting for zero-point energy 3=15447
- NaCl, calc., by sums in wave-vector space 3=20115
- NaCl, rel. to shock wave compression data 3=22670
- NaCl, using Kellermann model and repulsive potential 3=25205
- Ni, rel. to spec. ht. and Gruneisen coeff. change 3=6787
- Pb, rel. to spec. ht. and Gruneisen coeff. change 3=6787

Equations of state — contd

solids — contd

- Yb, 20-40 kbars, temp.-pressure curves 3=17899

Erbium

- atom of Er¹⁶⁹, h.f.s. meas. 3=22479
- electrical cond. rel. to screw-type spin ordering 3=15465
- electrical conductivity, 4.2-350°K 3=25322
- ferromag. screw struct. and transitions 3=975
- ferromag. spiral spin-configs., anisotropy effects 3=974
- ferromagnetic resonance, spin-wave theory 3=20635
- Hall effect, 4.2-350°K 3=25322
- magnetic phases, spiral structure model 3=3075
- magnetization-temp. data 3=25507
- spectrum, visible, rel. to 4f shell transitions 3=13182
- Er³⁺, electron structure, free and in cryst. field 3=8377
- Er³⁺ e.s.r. in CaF₂ 3=3172
- Er³⁺ in soln., near i.r. transitions 3=23885
- Er³⁺, spectra and energy levels in LaCl₃ 3=15683

Erbium compounds

- ethylsulphate, thermal study of crystal field splitting 3=4799
- ErAl₂, mag. moment and Curie pt. 3=991
- Er(C₂H₃SO₄)₃ · 9H₂O, crystal field parameters for Er 3=12900
- ErCl₃ · 6H₂O, paramag. relax., 1.1-4.2°K, 2-2660 c/s 3=8719
- ErCl₃ · 6H₂O, spin-lattice relax. 1.1° to 4.2°K 3=3183
- Er ferrite garnet, absorption spectrum, near i.r. 3=20475
- ErH₂₋₃, magnetization-temp. data 3=25507
- Er₂O₃, crystals, flame fusion growth 3=8805
- Er₂O₃, neutron scatt., energy distrib. 3=743
- Er₂O₃, specific heat and thermodyn. props. 3=20106
- (Er,Y)₂O₃, equiv. Er ions interact. 3=10565

Errors

- See Measurement, errors; Random processes.

Europium

- magnetic h.f.s., Mössbauer effect meas. 3=17631
- Eu³⁺, anomalous quadrupole h.f.s. in Nd ethyl sulphate 3=3173
- Eu³⁺, i.r. absorption spectra in soln. 3=9462
- Eu³⁺ in tungstates and molybdates, luminesc. 3=10987
- Eu¹⁵¹ abundance in meteorites 3=13875

Europium compounds

- divalent compounds, magnetic props. 3=15742
- ferromagnetism, indirect exchange 3=5003
- Eu dibenzoylmethane, Eu³⁺ emission lines 3=3061
- Eu ethyl sulphate, fluoresc., transition probabs. 3=25482
- EuFe garnet, elastic wave instability rel. to r.f. mag. fld. 3=18096
- EuFe garnet, exchange fields 3=1159
- EuFe garnet, magnetoelastic coupling 3=11043
- EuFe garnet, magnetoelastic coupling constants 3=15886
- EuFe garnet, mag. and elec. fields at Eu 3=12904
- Eu₂O₃, prep. and crystal structure 3=5104
- EuR₃ (R is organic radical), for possible maser, optical, by internal energy transfer 3=17072
- EuS, ferromag. behaviour at low temps. 3=1140
- EuS, ferromag. props. 3=11038
- EuS, ferromag. props. at low temps. 3=11050
- EuS, paramag. and ferromag. Curie temps. 3=3080
- EuS, second-neighbour exchange interact. 3=15781
- EuS, spin-wave contrib. to specific heat 3=2729
- EuSe, ferromag. behaviour at low temps. 3=1140
- EuSe, ferromag. Curie temp. 3=3080
- EuSe, ferromag. props. 3=11038
- EuSe, ferromag. props. at low temps. 3=11050
- Eu₂SiO₄, prep. and crystal structure 3=5104
- EuTe, antiferromag. props. 3=11038
- EuTe, antiferromag. props. at low temps. 3=1140
- EuTe, ferromag. props. at low temps. 3=11050
- EuTe, paramag. Curie temp. 3=3080
- Eu thenoyltrifluoroacetate in acetone, fluorescence quantum efficiency 3=23889
- Eu thenoyltrifluoroacetate, fluorescence, laser threshold parameters 3=23888
- Eu (trivalent) salts, u.v. absorpt. spectra 3=10944

Evaporation

- See also Vaporization.
- apparatus to meas. evap. thro. thin films 3=24114
- crystal deposits, orientation 3=3279
- dielectric and metallic layers, thickness control 3=11315

Evaporation — contd

- diffusion into gas, conditions 3=16649
- droplets, effect of heat transport 3=7391
- film prodn., intensity distrib. of metallic vapour 3=20934
- films, metal and dielectric, apparatus 3=5148
- films, solid, residual stress control 3=13566
- flowing gas mass transfer from wetted solid grains 3=11966
- liquids, heat and mass transfer 3=299
- metals with high m.p., in vacuum, films prep. 3=11316
- molecular flow distrib. on surface in vacuum 3=12011
- napthalene crystals, etch-pit formation 3=3934
- Permalloy, film decoration of cleaved NaCl 3=20931
- radiation beam pressure 3=19062
- raindrops 3=9040
- semiconductor films prodn., control of parameters 3=25776
- vacuum, apparatus, for refractory materials 3=5553
- vacuum evap., apparatus for ultra-high vacuum range 3=23954
- vacuum, glass surface contamination 3=21461
- vacuum, sources, reflection 3=16135
- vacuum technique, on to organic films 3=25773
- viscous flow mechanism, condensate structure 3=21320
- water, covered with monomolecular films 3=24114
- water, Ocean—atmosphere, in Antarctic 3=9027
- Al, from W heaters, W content meas. 3=1364
- Al—Fe films, Al source position and mag. anisotropy 3=18084
- Br from graphite bromide, in vacuo, electron microscope obs. 3=20175
- Cr, Cr + Ni, in vacuo, from electron diffr. exam. of films. 3=16143
- Fe thin films, rel. to magnetic anisotropy and domain structure 3=1079
- Fe—Al films, Al source position and mag. anisotropy 3=18084
- He II, liq., vapour velocity near surface 3=1883
- Ni, film decoration of cleaved NaCl 3=20931
- Ni + Cr, Cr, in vacuo, from electron diffr. exam. of films. 3=16143
- Ni—Fe layers, composition 3=18377
- Si films prepn. 3=8926
- Si, in vacuo, and film fabrication 3=20927
- SiO films, stress anisotropy rel. to prep. 3=11144

Examination of materials

See Electron diffraction examination of materials;
Electron microscope examination of materials; Neutron diffraction examination of materials; X-ray examination of materials.

Exchanges, chemical

See also Isotope exchanges.

- bimolecular reactions, Monte Carlo calculations 3=25811
- cationic, organic solvents, use of 3=18453
- ion exchange kinetics, revised tables 3=13588
- methanol and solvated cations and solvent 3=8944
- trimethylammonium ion in aq. soln., proton-transfer study by n.m.r. 3=25812
- PbBr₂, activity coeffs., in reciprocal molten salt systems PbBr₂ + NaCl and PbCl₂ + NaBr 3=16155
- Zr^{IV}, ions, hot, from U fission, exchange with ZrCl₄ 3=21006

Excitation

See Atoms, excitation; Molecules, excitation; Nuclear excitation; Vibrations, excitation.

Explosions

See also Detonation; Shock waves.

- air-cavity explosive charge for 0.097–0.67g projectiles 3=23824
- in air and water, small, e.l.f. (< 1 c/s) radn. 3=4265
- brittle medium, shock wave-front 3=23970
- detonation, liquid, crit. dia. 3=9548
- exploding wire circuits, current meas. and transient skin effects 3=3981
- exploding wire at liquid surface, cavity prodn. 3=118
- exploding wire at liquid surface, cavity prodn. 3=5422
- exploding wires, ionization ahead of shock front 3=1759
- explosives, protons, α -particles, range—energy relationships 3=17279
- gelatine, blasting, heat and rate of combustion 3=3394
- ignition time meas. 3=18441

Explosions — contd

- metals, flash lamp induced heating, compared with electrical 3=21628
- in non-uniform medium, shock wave parameters and shape 3=21485
- nuclear, and absorption of electromagnetic waves, decametric, ionospheric 3=7721
- nuclear, in atmosphere, ionospheric effects 3=13761
- nuclear and atmospheric electricity, pot. gradient, Poona, IGY 3=18514
- nuclear, atmospheric pressure changes, period amplitude relation 3=13667
- nuclear, e.m. signal rel. to earth's mag. fld. 3=7717
- nuclear, effects in ionospheric F2 region 3=6987
- nuclear, f_0F_2 irregularities 3=9070
- nuclear, geomagnetic disturbance, due to 320 km explosion 3=9133
- nuclear, at high altitude, enhancement of atmospherics 3=1450
- nuclear, high-altitude, and earth magnetic field and electrical variations 3=13841
- nuclear, high-altitude, effect on electron density, ionosphere, topside 3=18524
- nuclear, high-altitude, effect on 11.7 Mc/s long-distance propag. 3=14782
- nuclear, high-altitude, effects on airglow, 3914 6300 Å 3=13778
- nuclear, high-altitude, effects on v.l.f., 10 Mc/s propag. 3=12324
- nuclear, high-altitude and ionosphere, D region, ionization 3=21058
- nuclear, high-altitude, ionosonde f_{min} changes 3=16265
- nuclear, high-altitude, July 9, 1961, and earth currents 3=11381
- nuclear, high altitude, 9 July 1962, radio obs. 3=25924-5
- nuclear, high-altitude and mag. field vars., short time delay 3=23616
- nuclear, high altitude, and mag. impetus, double 3=25961
- nuclear, high altitude, and twilight, Li⁺, high abundance 3=18554-5
- nuclear, ionosphere, ionization distrib. 3=16243
- nuclear, and ionosphere, spread F development 3=9085
- nuclear, and ionospheric foF₂ disturbances 3=13738
- nuclear, July 1962, earth mag. field perturbations 3=3517
- nuclear, high-altitude, mag. and atmospherics effects 3=16306
- nuclear, "outside" atmosphere, subacoustic wave production 3=9060
- nuclear, rel. to atmospheric ionization 3=13727
- nuclear, Russian 1961, early fallout characteristics 3=8024
- nuclear, in space, effects 3=6968
- nuclear, near surface, long-period seismic waves 3=13642
- nuclear, 30 Oct. 1961, rel. to global atmos. pres. effects 3=9036
- nuclear, underground, e.m. signals 3=11380
- nuclear upper atmosphere and artificial electron injection, as research aid 3=16238
- thermonuclear, 9 July 1962, rel. to terrestrial—ionospheric cavity resonance 3=3485
- underground, detection, review 3=1418
- underwater, H₂—O₂ mixtures, for acoustic studies 3=9552
- underwater, sound backscatt. from deep-sea bed 3=3444
- upper atmosphere, chemical releases, expansion to ambient pressure 3=21047
- wire, shock waves, streak interf. obs., two wavelength, temps., electron conc. 3=18900
- wires, elec. conductivity during process 3=8488
- wires, interaction with microwaves 3=4103
- wires, plasma jacket, creation process 3=4102
- wires, shock-wave prod., review. 3=199
- wires, simultaneously at 2 ends of bar 3=22778
- W, wire and strip, flash lamp induced heating, compared with electrical 3=21628

Extra-terrestrial radiation

See Cosmic radiations, radio-frequency; Sun, radiation.

Eye

See also Vision.

- aberration on retina, rel. to response function 3=1564
- aperture rel. to vision and thermal hazards 3=16454
- cat, central visual pathways, integrative processes 3=5307

Eye — contd

- cornea, six-cap structure 3=16455
- electroretinogram during dark adaptation 3=7071
- frequency response, Mach effect 3=9302
- imaging props. of media, meas. 3=9303
- increment threshold rel. to dark adaptation 3=5298
- information efficiency 3=3922
- interaxial distance meas. 3=13963
- metal, pupil with radial or circular gratings 3=11892
- nervous excitation by visual pigment, mechanism 3=5288
- retina, amplifier effect mechanism 3=13965
- retina, artificial, using fibres 3=11626
- retina, cellular physiology 3=5289
- retina, "on" centre and "off" centre receptive fields 3=5291
- retina, sensitivity to photic flicker 3=13969
- retina, transfer function by Ronchi test 3=11625
- retina, vertebrate, electrical responses, mech. 3=5290
- retinal image formation, optical and motor factors 3=5294
- retinal image formation, optics, review 3=5293
- retinal inhibitory interaction of neural elements 3=5295
- retinal photoreceptors, struct. and mol. organiz. 3=5287
- retinal receptors, optical properties 3=5292
- rods, compartment theory for functioning 3=7070
- sensitivity during contralateral stimulation 3=9304
- spatial summation in visual pathways 3=13964
- tactile receptor vision theory 3=16461

F-centres.

See Colour centres.

Fallout

See also Atmosphere, radioactivity; Nuclear reactions; Radioactivity.

- and atmospheric radioactivity. 3=25912
- Bangkok, rain water activity 3=1453
- β -activity, particle size 3=5207
- dose-rate from fission products 3=9055
- early, from Russian 1961 explosions 3=8024
- effect of precipitation 3=9054
- Greenland ice, T content 3=24887
- highly radioactive, fractionation phenomena 3=13688
- increase, due to thermonuclear explosion, Johnston Island (9/7/62) 3=6191
- Indian studies 3=15127
- natural water, D content. 3=25898
- North America, September 1961 3=23602
- North Pacific surface water, T content 3=24888
- nuclear explosion of July 9 (1962), particle flux 3=6967
- from nuclear reactor fission accident, for various operating powers 3=8162
- particles, from Sept.-Oct. 1961 nuclear tests, electron microscope exam. 3=10280
- radioactive aerosols, coagulation and scavenging 3=8985
- in rain and snow, altitude distrib. 3=9053
- sea, distrib. between soluble, particle and colloid states 3=6190
- separate sampling of rainfall and dust 3=3476
- soil, distribution, rel. to weapons tests 3=12613
- soil radioactivity distribution, rel. to weapons tests 3=12613
- from space explosions 3=6968
- Sydney, from 1962 Christmas Island tests 3=15128
- tritium meas. in rain, 1960-61 3=3478
- Winnipeg, 1958-62, near-ground activities 3=21041
- Be⁷, rain and air, and Cs¹³⁷, var. 3=25904
- Cs¹³⁷ at ground-level, 1960-1 3=13689
- Cs¹³⁷ level in biosphere, Toronto 1961-2 3=23604
- T, in resin, var., and Sr⁹⁰. 3=25896
- Y⁸⁸, on Zr⁹⁵ 3=12612

Faraday effect

See Magneto-optical effects.

Fatigue

See Elastic fatigue.

Fermions

See Fundamental particles; Quantum theory, many-particle systems.

Fermium

No entries this year

Ferrimagnetic resonance

- demagnetizing factors effect 3=3158
- ferrite films, chem. deposited 3=16141
- ferrite spheroids, coupled, instability modes 3=15926
- ferrites, dense polycrystals, linewidth 3=15927
- γ -Fe₂O₃ micropowder 3=1175
- magnon interactions in various directions, calc. 3=20636
- optical interaction, in YFe garnet 3=6644
- paramagnetic suscept. of system, calc. 3=20562
- parametric coupling of magnetization and strain 3=13293-4
- permeability rel. to appl. mag. field or internal field 3=3159
- quantum statistical theory at high temps. 3=23214
- rare-earth in relaxation in iron garnets 3=15925
- rare-earth iron garnets, Kaplan-Kittel resonance 3=8597
- use in microwave modulation of light 3=14325
- BaFe_{12-2x}Ir_xZn_xO₁₉, linewidth, rel. to composition 3=15878
- CoMn ferrite, anomalies 3=15924
- Li ferrite, disordered, linewidth rel. to temp. and freq. 3=5033
- MgCuCr ferrite 3=6743
- Mn-Mg-Co ferrite, crit. microwave field strength 3=3160
- NaFe fluoride, ferrimag. props 3=25547
- Ni ferrite single crystals 3=13274
- Ni ferrites, polycryst., rel. to spin waves 3=3126
- Tm₃Fe₅O₁₂ 3=25557
- YFe garnet, microwave absorption in parallel-pumping expts. 3=15883
- YFe garnet, multiple magnon processes 3=18122
- YFe garnet, rare earth doped, line widths 3=1174
- YFe garnet, rare-earth doped, theory, ang. and temp. var. 3=23216
- YFe garnet, rare-earth substituted, rel. to temp. 3=23215
- YFe garnet, rel. to Ga and In substitutions 3=1048
- YFe garnet, relax., near instability threshold 3=3157
- YFeAl ferrite 3=6743
- Y₃In_xFe_{9-x}O₁₂, (x < 0.5) 3=20800
- YbFe garnet, far i.r. 3=15930

Ferrimagnetism

- crystallographic point groups and macroscopic symmetry in space-time 3=23366
- crystals, symmetry considerations 3=13233
- dispersion relations and instabilities 3=23192
- electromagnetic wave radiator, 8 kMc/s, in pulsed mag. field 3=24463
- magnetic moment, d.c., induced by r.f. field parallel to d.c. field 3=13260
- magnetostriction in cubic Néel ferrimagnets 3=15901
- magnons, longitudinal parametric excitation 3=23192
- parametric coupling of magnetization and strain 3=13293-4
- single crystal ellipsoid, longit. pumping of magnetoelastic waves 3=15898
- single crystals, ordered, unstable growth of phonons at microwave freq. 3=15897
- spin configurations coupling by anisotropy 3=3091
- spin ordering theory, based on collective electron model 3=25517
- spin-wave growth under parallel pumping 3=15899
- spin-wave instability, high-order 3=23146
- spin-wave instability in hexagonal ferrites 3=11096
- spin waves in polycryst. ferrites 3=3126
- spinels, cubic, ground spin state, classical theory 3=11100
- translational inertial spin effect 3=3711
- Ni ferrites, polycryst., anisotropy const. and g factor 3=3126

Ferrites

- See also Magnetic properties of substances.
- calculating computer storage elements 3=23175
- cavity resonators, ferrite-loaded, e.m. and magnetostatic mode coupling 3=14777
- coercivity 3=15895
- compensation point, effect on phys. props. 3=6719
- cores, B-H charact., coercivity rel. to driving field 3=23157
- cores, magnetothermal saturation 3=1153
- cores, magnetothermal saturation 3=6727
- crystallite dias., var. due to locking of boundaries by pores 3=11242

Ferrites—contd

- demagnetization, role of mag. hysteresis 3=8692
- disaccommodation rel. to cation vacancies 3=3128
- e.m. oscillations, parametrically coupled 3=17047
- for e.m. propag., guided waves 3=24475
- e.m. wave reflected by magnetization wave, Doppler effect 3=4269
- electrical resistance, pressure effects of 4 ferrites 3=25370
- electromagnetic wave radiator, 8 kMc/s, in pulsed mag. field 3=24463
- ellipsoid, ferromag. reson., width, temp. depend. 3=6737
- F-1000, F-20, 78 and 191, u.h.f. complex permittivities 3=5024
- ferrite—paraffin oil, dielec. props. rel. to ultrasound 3=9471
- ferromag. reson., sphere, v.h.f. power absorbed, temp. meas. 3=11106
- ferromag. reson. theory in uniaxial crystals 3=3152
- ferromag. resonance, u.h.f. power absorption, thermal effects 3=23213
- ferromagnetic reson., shape-dependent effects 3=20632
- ferromagnetic resonance, absorption line width, temp. depend. 3=3150
- at ferromagnetic resonance, fluctuation radiation 3=6739
- ferromagnetic resonance linewidth of dense polycrystals 3=15927
- ferromagnetic resonance investigation, 9500 to 38600 Mc/s 3=15918
- ferromagnetic resonance, sphere, shape and magnetostatic effects 3=23211
- films, chemical deposition and mag. props. 3=16141
- franklinite, magnon dispersion, by neutron scatt. 3=3127
- garnets, crystal structure and magnetic properties 3=15887
- garnets, preparation temp., Bi substitution effect 3=23191
- grain structure, mag. spectra 3=3122
- hexagonal structures related to $\text{Ba}_2\text{Zn}_2\text{Fe}_{12}\text{O}_{22}$ 3=23458
- with high saturation magnetization and narrow resonance absorption line 3=8687
- Hopkinson effect absence 3=23187
- hysteresis loops, nonsymmetrical, creep effects 3=8688
- hysteresis rectangular loops, and losses, 2mm ring cores, 1000 c/s - SMC/s 3=15894
- ionic compounds, various, magnetic interactions 3=15741
- magnetization of hollow cylinder, magnetostatic oscillations 3=3131
- magnetization reversal, rotational in polycrystals 3=15865
- magnetostriction, meas. from ferromagnetic resonance 3=14714
- memory cores, history, effect on switching 3=15869
- memory cores, multipath, flux switching 3=15870
- memory cores, permeability ratios, rel. to nondestructive readout 3=15871
- microwave dielec. const. and loss at high temps. 3=22978
- microwave, quality improvement possibilities 3=8685
- microwave, review 3=6556
- multiple component (Ni, Zn, Cu, Co), magnetostrictive parameters 3=8686
- neutron scatt., one-quantum, spin-phonon interaction 3=25542
- neutron scatt., spin-spin interact. effects 3=25541
- new materials for electronics applications 3=20369
- orthoferrites, magnetic domains by Kerr effect 3=18103
- paramag. susceptibility of mixed ferrites 3=6722
- permeability, complex, meas., by coaxial resonator, 10-1000 Mc/s 3=17017
- polycrystalline, ferromagnetic reson., 4.2 and 293°K, 3.2cm 3=6740
- polycrystalline growth rel. to porosity 3=6822
- power limiters, frequency range 3=15882
- rare earth garnets, mag. viscosity, fast component, rel. to mag. fld. and temp. 3=18102
- rare-earth-Fe garnets, ferrimagnetic relaxation 3=15925
- rare-earth iron garnets, sublattice magnetization 3=25545
- rare earth, ortho, single crystals, mag. anisotropy consts. 3=8683

Ferrites—contd

- rare earth, three magnetic sublattices, normal energy state 3=6720
- spheroids, coupled, instability modes in resonator action 3=15926
- spin configurations coupling by anisotropy 3=3091
- spin-wave instability in hexagonal ferrites 3=11096
- spinel, containing Co^{57} and Tb^{161} , hyperfine Zeeman splitting, 85° and 300°K 3=994
- square-loop, magnetization-reversal process 3=13275
- structure relation with cementite 3=23447
- susceptibility tensor meas. 3=20612
- with three mag. sublattices, temp. dependence of mag. props. 3=23188
- u.s. absorption 3=13278
- Ba, coercivity 3=15895
- Ba ferrite, high-coercivity state 3=11094
- Ba ferrite, powder, single-domain magnetic props. 3=15880
- Ba ferrite powders, coercive force, effect of particle size 3=15879
- $\text{BaM}_{\frac{1}{2}}^{\text{II}}\text{M}_{\frac{1}{2}}^{\text{III}}\text{O}_{12-\frac{1}{2}\text{M}^{\text{III}}-\frac{1}{2}\text{M}^{\text{II}}}\text{F}$ ($\text{M}^{\text{III}} = \text{Al}^{3+}, \text{Ga}^{3+}, \text{Fe}^{3+}; \text{M}^{\text{II}} = \text{Ni}^{2+}, \text{Co}^{2+}, \text{Cu}^{2+}, \text{Zn}^{2+}$) substitutions and magnetization 3=1013
- $\text{BaCo}_2\text{Fe}_{18-2x}\text{O}_{27}$, hexagonal anisotropy 3=1029
- $\text{BaFe}_{12-2x}\text{O}_{19}$, linewidth, rel. to composition 3=15878
- $\text{BaFe}_{12}\text{O}_{19}$, magnetic anisotropy, effect of F-compensated Co^{2+} 3=15877
- $\text{Ba}_{1-x}\text{Sr}_x0.6\text{Fe}_2\text{O}_3$, mag. props., texture effects 3=20615
- Ba and Sr mixed, magnetic energy, magnetization and coercive force 3=13279
- BiFeO_3 , lattice constants and magnetic properties, rel. to temp. 3=20770
- BiFeO_3 , magnetic ordering, by neutron diffraction, 20 and 600°K 3=5018
- Co ferrite crystals growth, ferrous free 3=11230
- Co ferrite, internal mag. field at Co nuclei 3=1154
- Co ferrite, magnetostriction changes rel. to thermo-magnetic treatment 3=13264
- CoFe_2O_4 , films, Faraday rotation and mag. hysteresis 3=15655
- CoFe_2O_4 , magnetic domain structure 3=11098
- CoMn ferrite, ferrimag. resonance anomalies 3=15924
- $\text{Co}_{2-x}\text{Zn}_x\text{TiO}_4$, ferrimag. props. 1.6° -400°K 3=1030
- Cr ferrite, alloyed with various metals, softening and atomic bond energies 3=20900
- $\text{Cu}_{0.8}\text{Cd}_{0.2}\text{Fe}_2\text{O}_4$, magnetization increase 110-200 kOe 3=20617
- CuFe_2O_4 , cubic-tetragonal phase transform. 3=11205
- DyFe garnet, etching 3=18240
- Er ferrite garnet, absorption spectrum, near i.r. 3=20475
- EuFe garnet, mag. and elec. fields at Eu 3=12904
- EuFe garnet, magnetoelastic coupling constants 3=15886
- FeCo, rotational hysteresis, domain dynamics 3=13269
- Fe-Co ferrites, induced anisotropy, theory & exptl., and disaccommodation phenomena 3=1032
- Fe garnets, lighter rare-earth ions, mag. props. 3=20620
- Fe_2LiO_8 , ordered, Fe^{37} n.m.r. 3=1204
- FeMn ferrite, 1st anisotropy const., mag. structure, temp. depend. 3=13273
- Fe-Ni ferrites, ferromag. resonance, anisotropy and g-values 3=1171
- GdFe garnet, etching 3=18240
- GdFe garnet, far i.r. absorption spectrum 3=15680
- GdFe garnet, magnetic anisotropy 3=15787
- GdFe garnet, temp. dependence of mag. props. 3=23188
- $3\text{Gd}_2\text{O}_3:5\text{Fe}_2\text{O}_3$, compensation pt., effect on props. 3=6719
- HoFe garnet, far i.r. absorption spectrum 3=15680
- La, ortho, effect of substituting Al^{3+} for Fe^{3+} from mag. meas. 3=8683
- Li, disordered, ferrimag. reson. linewidth 3=5033
- Li, elastic modulus and damping, anomalies 3=5061
- Li ferrite, square-loop props., effect of grain size 3=15876
- Li ferrite-chromite, compensation pt., effect on props. 3=6719
- LiNiZn , square hysteresis loops 3=15866
- LiTi ferrite, nonlinear effects at high powers, elec. cond. effect 3=15887
- LuFe garnet, square hysteresis loops 3=15868
- MgCuCr, ferrimagnetic resonance 3=6743
- Mg-Mn cores, square-loop, flux reversal 3=1084

Ferrites—contd

- Mg—Mn, demagnetizing energy 3=9899
 MgMn, domain wall motion inhibition 3=15872
 MgMn ferrite, hysteresis loops, rectangularity 3=13272
 MgMn, new materials for memory cores 3=15875
 MgMn, rotational hysteresis losses 3=18101
 MgMn spinels, ferromag. reson. line widths, temp. and freq. depend. 3=23210
 MgO—MnO—Fe₂O₃, properties rel. to Sc₂O₃, addition 3=20613
 MgZn, neutron diffraction study 3=23184
 Mn, anisotropy, induced uniaxial, effect on impulse behaviour 3=15893
 Mn, decay phenomena, rel. to domain walls 3=8689
 Mn, lattice const. and X-ray refl. 3=3304
 Mn, magnetization 3=15890
 Mn, Mn—Mg, rectangular hysteresis loop 3=23189
 Mn—Fe, mag. viscosity and hysteresis 3=6724
 Mn ferrite, disaccommodation rel. to cation vacancies 3=11097
 MnCo, mag. props. at low temps. 3=5023
 Mn ferrite, effect of Li subst. on mag. props. 3=15891
 Mn ferrite monocrystals, electrical conductivity 3=20334
 Mn ferrites, domains study by Kerr effect 3=13276
 Mn and Ni ferrites with magnetite, mag. after-effects 3=1036
 MnFe₂O₄, low-field magnetization, temp. depend. 3=13271
 MnFe₂O₄, Mn⁵⁵ n.m.r. 3=15965
 Mn_{1-0.5}Fe_{1.5}O₄, crystal structure 3=13463
 Mn_{1.16}Fe_{1.84}O₄, elec. props., heat treatment depend. 3=22949
 Mn_xFe_{3-x}O₄, specific heat, 1.5–6°K anomaly 3=15435
 Mn_xFe_{3-x}O₄, mag. anisotropy, magnetoresistance 3=13270
 Mn_xFe_{3-x}O₄, mag. anisotropy, origin 3=11058
 Mn_xFe_{3-x}O₄, magnetostriction consts. 3=1031
 Mn_xFe_{3-x}O₄, neutron-diffraction study 3=1114
 Mn_xFe_{3-x}O₄, relaxation spectrum 3=1037
 Mn—Mg—Co, critical microwave field strength 3=3160
 Mn—Mg—Co ferrite, subsid. resonance, rel. to crit. microwave fld. strength 3=18121
 MnO.Fe₂O₃, domain obs. by Kerr effect 3=15864
 MnTi_xFe_{2-x}O₄, magnetocrystalline anisotropy, 4° to 225°K 3=1028
 Mn—Zn, growth, effect of voids and inclusions 3=3269
 MnZn ferrite, mag. curves rel. to pressure 3=13277
 Mn—Zn ferrites, disaccommodation, effect of Li addition 3=20611
 Mn—Zn ferrites, granular struct., mag. and elec. props. 3=1083
 Mn—Zn ferrites, induced anisotropy and disaccommodation 3=1034
 Mn—Zn—Fe ferrites, permeability, anisotropy 3=20619
 Ni, anisotropy, prod. by rotary field tempering 3=15892
 Ni, memory core, switching properties 3=15874
 Ni, polycryst., spin waves 3=3126
 Ni, resistivity, change on mag., anisotropy 3=17927
 Ni_{1-x}Co_xFe₂O₄, mag. anisotropy 3=1033
 Ni—Fe, Barkhausen effect, direction, in rotating disk 3=11067
 NiFe, mag. anisotropy, influence of empty cation sites, 200–300°C 3=6726
 Ni ferrite, ferromag. resonance line width 3=1160
 Ni ferrite, fine particles, ferromag. resonance 3=1161
 Ni ferrite, growth and props. of single crystals 3=3270
 Ni ferrite, initial permeability, effect of wall dimensions 3=3123
 Ni ferrite, single crystals prep., mag. props. 3=13274
 Ni and Co ferrite—chromite series, anomalous mag. moment 3=25544
 Ni₂Fe₂O₄, films, Faraday rotation and mag. hysteresis 3=15855
 NiFe₂O₄, flux growth by Czochralski method 3=16043
 Ni—Fe ferrite, natural ferromag. res. 3=3156
 Ni—Fe ferrite, relaxation loss 3=8691
 Ni—Fe ferrites, with small Co-substitution, induced anisotropy 3=1035
 NiO.(1-x)Fe₂O₃.xAl₂O₃, ferrimag. compensation pts. 3=13268
 Ni—Zn, diffusion aftereffect below 90°K 3=5022
 Ni—Zn, elec. conduct. rel. to porosity 3=4939
 Ni—Zn, elec. resist., pressure depend. 3=4940

Ferrites — contd

- NiZn, ferromagnetic reson., 4-2 and 293°K, 3-2cm 3=6740
 Ni—Zn, growth, effect of voids and inclusions 3=3269
 NiZn, thermal and elec. conds., Curie points, 50–350°C 3=20618
 Ni—Zn, thermal cond. meas., 20°–400°C 3=25214
 NiZn, thermal conductivity 3=17669
 NiZn ferrite, irreversible magnetic stress effects in Raleigh region 3=8690
 Ni—Zn ferrites, disaccommodation, rel. to γ -irrad. 3=11095
 Ni—Zn ferrites, electric rel. to magnetic properties 3=8684
 Ni—Zn ferrites, electrical props. 3=20336
 Ni—Zn ferrites, granular struct., mag. and elec. props. 3=1083
 Ni—Zn—Co, effect of annealing in mag. field 3=3130
 Ni—Zn—Co, magnetocryst. anisotropy and prod. 3=23190
 NiZnCo, films, prep. and mag. props. 3=18140
 NiZnCo, magnetoelastic effect 3=20614
 NiZnCo ferrite, mag. dispersion rel. to sintering temp. and composition 3=18100
 Ni—Zr—Cr ferrite, Faraday effect rel. to permittivity 3=1050
 Pr, ortho, effect of substituting Al³⁺ for Fe³⁺, from mag. meas. 3=8683
 SmFe garnet, far i.r. absorption spectrum 3=15680
 Sr ferrite, modified, new permanent magnet material 3=15881
 Sr ferrite, powder, single-domain magnetic props. 3=15880
 TbFe garnet, magnetoelastic coupling constants 3=15886
 Y, initial permeability, var. with freq., temp., garnet struct. 3=6723
 Y ferrite, noise 3=20631
 Y ferrites, hydrothermal synthesis 3=18272
 YFe, ferromagnetic resonance 3=6738
 YFe, rotational magnetization reversal 3=15873
 YFeAl, ferrimagnetic resonance 3=6743
 Y garnet with rare-earth impurities, resonance line width 3=25558
 YFe garnet, crystal field calc. for 3 sites 3=2693
 YFe garnet, etching 3=18240
 YFe garnet, heat transport by spin waves 3=8374
 YFe garnet, magnetoelastic interactions in parallel pumping 3=15884
 YFe garnet, magnetostrict., meas. and theory 3=15901
 YFe garnet, magnetostriction 3=15852
 YFe garnet, microwave absorption in parallel-pumping expts. 3=15883
 YFe garnet, multiple magnon processes 3=18122
 YFe garnet, relax., near instability threshold 3=3157
 YFe garnet, single crystal, saturation magnetostriction 3=15888
 YFe garnet, spin-wave growth under parallel pumping 3=15899
 YFe garnet, spin-wave propag. and magnetoelastic interaction 3=15889
 YFe garnet, spin-wave spectrum anisotropy 3=23209
 YFe garnet, square hysteresis loops 3=15868
 YFe garnet, 2-magnon scatt. processes 3=15916
 YFe garnets, ferromag. reson. line widths, temp. and freq. depend. 3=23210
 Y₂Fe₂O₇, neutron diffr. exam. 3=23186
 YGa garnet, absorpt. spectrum of Er³⁺ 3=13172
 YNd garnet, neutron diffraction investigation 3=23183
 YbFe garnet, ferrimagnetic resonance in far i.r. 3=15930
 Zn, decay phenomena, rel. to domain walls 3=8689
 Zn₂Y, spin-wave excitation in parallel pumping 3=15885
- Ferroelectric devices**
 See Dielectric devices.
- Ferroelectric materials**
 bibliography 3=13102
 crystals, ceramics, applications 3=13110
 cylindrical tubes, vibration theory 3=11846
 e.m. and sound waves, interaction 3=2949
 glycine sulphate, domain wall, dislocation catching 3=6618
 guanidine aluminium sulphate hexahydrate reorientation of [C(NH₂)₃]⁺ 3=4941
 guanidine aluminium sulphate, piezoelectricity, inverse 3=23008
 guanidinium sulphate, γ -ray effects 3=17937

Ferroelectric materials—contd

- internal friction, meas. by composite resonator method 3=20698
 manganites of rare earths and Y, prep., dielec. props. 3=13119
 neutron diffraction studies 3=899
 perovskite, acoustic and X-ray excitation of anomalous layers 3=22993
 perovskite, coexistence with ferrimagnetism 3=6614
 perovskite-type (ABO₃) electric field gradient 3=22992
 Rochelle salt, domain walls in sudares 3=2959
 Rochelle salt, effect of Cu²⁺ doping on "delayed phenomena" 3=25404
 Rochelle salt, effects of radiation damage 3=10883
 Rochelle salt, electrostriction 3=13121
 Rochelle salt, interaction of e.m. and sound waves 3=2949
 Rochelle salt, permittivity, rel. to applied elec. fld. 3=23001
 Rochelle salt, and Raman spectrum 3=20484
 Rochelle scatt, electrocaloric effects meas. 3=25403
 rutile, far i.r. props. 3=15687
 rutile single crystals, space-charge-limited currents and polarization 3=895
 tetramethylammonium mercury tribromide [N(CH₃)₄HgBr₃] 3=13488
 thiourea, low-temp. phase, electron diffr. crystallography 3=18330
 titanates, various, permittivity, variation with temp. 3=2953
 triglycine sulphate, critical-pt. polarization fluctuations 3=893
 triglycine sulphate, corrosion by domain boundaries 3=8563
 triglycine sulphate, Curie transition temp., press. depend. 3=17938
 triglycine sulphate, deuterated 3=13122
 triglycine sulphate, domain nucleation 3=6619
 triglycine sulphate, elastic props. and internal friction 3=13323
 triglycine sulphate, far i.r. props. 3=15687
 triglycine sulphate, high pressures, hysteresis 3=23004
 triglycine sulphate, inverse piezoelec. effect, various dependences 3=20391
 triglycine sulphate, permittivity increase during slow switching 3=2960
 triglycine sulphate, polarization relaxation above Curie temp. 3=2961
 triglycine sulphate, properties, rel. to γ -irradiation 3=20387
 triglycine sulphate, thermal expansion 3=6481
 Ag-ferroelec. two-phase systems 3=13109
 Ba_{0.95}Pb_{0.05}TiO₃, anomalous polarization and discharge currents 3=13120
 Ba_{0.72}Sr_{0.28}TiO₃ ceramic, rejuvenation 3=8561
 (Ba_xSr_{1-x})TiO₃, dielec. and electrocaloric props. 3=2957
 BaTiO₃, Co addition effects, -80 to +120°C 3=22996
 BaTiO₃ ceramics, neutron-irrad., in elec. field 3=896
 BaTiO₃ ceramics, resistance, elec., temp. var., anomalous, intergranular barrier model 3=25399
 BaTiO₃ circular disk, vibrations 3=20389
 BaTiO₃ crystal structure, refinement 3=1331
 BaTiO₃, cubic-tetragonal transition, nucleation 3=4942
 BaTiO₃, Curie point reduction at high pressures 3=22994
 BaTiO₃, domain conversion 3=13115
 BaTiO₃, domain obs., by electron microscopy 3=13113
 BaTiO₃, 90° domain walls 3=10878
 BaTiO₃, 90° and 180° domain interaction 3=2952
 BaTiO₃, effect of MnO₂ doping 3=8560
 BaTiO₃, electric strength, temp. variation 3=15619
 BaTiO₃, ferroelectricity, rel to lattice dynamics 3=838
 BaTiO₃, films, monocrystalline, prep. method 3=2954
 BaTiO₃, high field polarization reversals 3=13114
 BaTiO₃, microwave dielec. dispersion, mechanism 3=25398
 BaTiO₃, phase transition, nucleation mech. 3=4943
 BaTiO₃ powder, ceramic, crystal, dielec. loss 3=894
 BaTiO₃, secondary piezoresistivity 3=10879
 BaTiO₃, single-crystal domain structure, switching 3=897
 BaTiO₃, switching time, thickness depend. 3=4944

Ferroelectric materials—contd

- BaTiO₃, temp. depend. of breakdown field 3=4948
 BaTiO₃, temp. var. 3=10903
 BaTiO₃, transition to paraelectric, effect of grain size 3=8792
 BaTiO₃, X-irrad., dielec. loss 3=968
 BiFeO₃, magnetic ordering, by neutron diffraction, 20 and 600°C 3=5018
 Ca₂B₆O₁₁·5H₂O, internal biasing fields 3=20383
 Ca_xBa_{1-x}TiO₃, temp. depend. 3=20122
 K dihydrogen phosphate, relaxation in extreme i.r. 3=17942
 KH₂PO₄, far i.r. props. 3=15687
 KH₂PO₄, low freq. H vib. 3=20384
 KNO₃, props. at room temp. 3=2958
 KTaO₃, far i.r. dielectric dispersion 3=4947
 KTaO₃, props. near Curie point 3=17936
 LiH₃(SeO₃)₂, dielectric constants 3=10881
 LiNbO₃ 3=23454
 MgTiO₃, microwave props. 3=13112
 MnYO₃, oscillation times under steeply rising voltage pulses 3=25402
 (NH₄)₂BeF₄, elec. parameters near transition pt. 3=17941
 (NH₄)₂BeF₄, F¹⁹ n.m.r. 3=3194
 (NH₄)₂BeF₄, phase transition, thermodynamics 3=15621
 NH₄ dihydrogen phosphate, relaxation in extreme i.r. 3=17942
 (NH₄)₂SO₄, elec. cond. and transition -72° to 200°C 3=20382
 (Na, K)NbO₃ ceramics, spontaneous polarization 3=892
 NaNO₂, below 163°C, twin structure 3=25657
 NaNO₂, ferroelec. phase transition, X-ray study 3=25405
 NaNO₂, phase transition, X-ray study 3=13397
 NaNO₂ single crystals 3=10885
 NaNO₂ single crystals 3=23002
 NaNbO₃, field-induced ferroelec. phase, crystal structure 3=8853
 Pb(Fe_{1/2}Nb_{1/2})O₃, ferroelec.-antiferromag. props. 3=6615
 Pb(Fe_{2/3}W_{1/3})O₃, ferroelec.-antiferromag. props. 3=6615
 Pb₂MgWO₆, antiferroelectric polymorphic transition point rel. to press. 3=17945
 Pb(Sr_{0.95}Nb_{0.05})_xΦ_{1-x}O₃, Φ = Ti, Zr, Hf 3=6616
 PbTiO₃-BiFeO₃, Curie point behaviour 3=13116
 PbTi_{1-x}Zr_xO₃, p-type elec. conductivity 3=25400
 PbZrO₃, ageing and irrad. effects 3=13118
 PbZrO₃, complex dielec. const. 3=2956
 PbZrO₃, dipole structure and internal elec. fields 3=22997
 Pb(Zr_{0.85}Ti_{0.15})O₃, with 1 wt. % Nb₂O₅, transformation, FE₁-FE₂ 3=22998
 PbZr_{0.95}Ti_{0.05}O₃, velocity acoustic and phase transform., Fe₁-Fe₂ 3=15618
 (Sr_{0.78}Ca_{0.24})(Ti_{0.76}Sn_{0.24})O₃, anomalous polarization and discharge currents 3=13120
 SrNb₂O₆-0.5YbFeO₃ 3=23003
 SrTiO₃, dielec. const. at low temps 3=4946
 SrTiO₃, dielec. and electrocaloric props. 3=2957
 SrTiO₃, dielec. and electrostrict. 3=8562
 SrTiO₃, dielectric loss, u.h.f. defect theory, var. with freq. and temp. 3=17933
 SrTiO₃, frequency and temp. depend. of dielec. const. 3=25398
 SrTiO₃, microscopic examination, low-temp. 3=17940
 SrTiO₃-Bi₂O₃·3TiO₂, nonlinear props. 3=15620
 Ti ceramic, conductivity, electrical, var. during ageing 3=20380
 TiO₂, microwave props. 3=13112
 ZnO-TiO₂-NiO ceramics, temp. coeff. of resist. 3=13117

Ferroelectric phenomena

- antiferroelec. linear chain model, temp.-depend. lattice spectrum 3=748
 Cherenkov radiation in transport crystal 3=17241
 constant-current characteristics of ceramics with positive temp. coeff. of resistance 3=25395
 crystallographic point groups for simultaneous ferromagnetism 3=18069
 dipole structure patterns 3=22991

Ferroelectric phenomena — contd

- dipole structures, from active ion concept 3=25394
- domain structure obs. by electroluminescence 3=13111
- electrostriction, rel. to microscopic props. of lattice theory 3=25413
- experimental criterion and charact. props. 3=25396
- hysteresis loops obs., sample holder 3=7420
- mixed ferroelectric and ferromagnetic phase, after second-order transition 3=23147
- and Mössbauer effect 3=8559
- one-domain crystal, polarization nonlinearity 3=25389
- one-particle Green's function, field depend. 3=15618
- parameters, high-freq. exact meas. 3=2951
- perovskite structures, dipole arrangements 3=2950
- phase transformations, and scattering, light 3=20450
- phase transition, broadening, mechanism 3=17935
- phase transitions, rel. to paramag. particles 3=15935
- plate-like crystals, domainless structure near Curie point 3=25397
- polar crystals, ferroelectricity and antiferroelectricity 3=15615
- polarization and hysteresis, theory 3=17934
- polarization waves in solids 3=25388
- polycrystals, symmetry limitations to polarization 3=10876
- proton-lattice interact. in H-bonded crystals 3=15408
- switching functions and Sievert integral 3=10875
- NH₄HSO₄, transformations and specific heat, -2.55°C 3=20101

Ferromagnetic relaxation

- ferromag., antiferromag. materials in paramag. range 3=13265
- films, relaxation time 3=15923
- instabilities theory, quantum-mech. model 3=13291
- rare-earth ions in iron garnets at resonance 3=15925
- two-magnon processes 3=23202
- two-magnon relax. in disordered ferromag. 3=1193
- Ni, two-magnon spin-spin relax., model 3=1193
- Ni-Co alloys, and related phenomena 3=8681

Ferromagnetic resonance

- absorption, effect of scatt. between spin waves 3=25555
- absorption of spatially inhomog. e.m. waves 3=3153
- critical microwave amplitude for subsid. absorpt. 3=6742
- damping, theory 3=1165
- ferrite sphere, fluctuation radiation 3=6739
- ferrite sphere, shape and magnetostatic effects 3=23211
- ferrite sphere, v.h.f. power absorbed, temp. meas. 3=11106
- ferrites, absorption line width, temp. depend. 3=3150
- ferrites, 9500 to 38600 Mc/s 3=15918
- ferrites, polycrystalline, 4.2 and 293°K, 3.2 cm 3=6740
- ferrites, u.h.f. power absorption, thermal effects 3=23213
- ferrites, uniaxial single crystals, theory 3=3152
- ferrites, use to meas. magnetostriction 3=14714
- and ferromagnetic measurements 3=23211
- films, spin-wave resonance 3=15921
- films, tables, review 3=23174
- generation of microwave elastic vibr. 3=23958
- high-field expts, 35-70 kMc/s 3=1158
- internal, obs. technique 3=23203
- intrinsic contrib to linewidth at high temps. 3=15915
- line width and relaxation, main mechanisms 3=3154
- linewidth theory using thermodyn. retarded Green functions 3=18120
- magnetic films, spin-wave res. 3=1167
- magnetostatic modes, effect of e.m. propag. 3=23212
- magnetostatic precession in anisotropic sphere 3=1173
- main reson., isolated uniform precession mode 3=1170
- measurement of frequency and temp. dependence (-190 to +500°C) 3=24502
- metal, film, rel. to superficial and deep layers 3=23206
- metal films, spin resonance, d.c. detection 3=15934
- metals, spin-wave, magnetic moment, boundary condition effect 3=13289
- metals, uniaxial, Green functions calc. 3=13287
- microwave phonon propag., instabilities 3=5032
- narrow line width, meas. by radiated fields 3=12335
- Permalloy films 3=20633
- Permalloy films, effect of surface roughness 3=15840

Ferromagnetic resonance — contd

- Permalloy films, microwave refln. 3=11105
- Permalloy films, regional variation of anisotropy 3=25556
- Permalloy films, spin-wave instability 3=15922
- Permalloy films, spin-wave resonance 3=15920
- Permalloy films, with transverse r.f. fields 3=15917
- Permalloy, homogeneity investigation 3=18393
- quantum statistical theory at high temps. 3=23214
- rare earth Fe garnets, exchange fields 3=1159
- rare-earth Fe garnets, i.r. exchange resonance 3=1166
- relaxation theory, present status, review 3=1162
- review of Soviet work since 1958 3=1135
- rhombohedral weak ferromagnetics, h.f. susceptibility tensor 3=3151
- saturation effects 3=15916
- shape-dependent effects, in mag. ferrites 3=20632
- single-domain particles in powders, expt. and theory 3=6741
- spin wave coherent amplification 3=23208
- spin-wave instabilities, suppression 3=1164
- spin wave res. in ferromag. conductors 3=23207
- spiral spin structures, spin-wave theory 3=20635
- tensor theory, generalization 3=6735
- tetragonal weak ferromagnetics, h.f. susceptibility tensor 3=3151
- thin films, 100 kc/s to 1000 Mc/s 3=15917
- thin mag. films 3=1062
- uniaxial ferromagnetics 3=6736
- width, temp. depend., in ferrite ellipsoid 3=6737
- BaFe₁₂O₁₉ 3=20634
- Co, f.c.c., rel. to anisotropy 3=1038
- (CoO)_{0.03}(MnO)_{0.825}(MgO)_{0.875}Fe₂O₃, subsidiary resonance 3=18121
- CrBr, line widths 3=23204
- CrBr₃, microwave obs. 3=15656
- CrCl₃, line widths 3=23204
- Dy, spin-wave theory 3=20635
- Er, spin-wave theory 3=20635
- Fe films, spin-wave resonance 3=3155
- Fe single-crystal films, 9, 18, 24 Gc/s 3=20630
- Fe, single crystal films on MgO 3=15919
- Fe-Ni ferrites, anisotropy and g-values 3=1171
- α-Fe₂O₃, line broadening 3=25523
- γ-Fe₂O₃, single-domain particles 3=6741
- Fe₃S₈, absorpt. rel. to sample orientation 3=13288
- HoN, model, spin-wave approx. 3=13292
- MgMn spinels, line widths, temp. and freq. depend. 3=23210
- MnCO₃, high freqn., in canted stated 3=13290
- Ni, effect of surface condition and lattice defects 3=1172
- Ni films 3=23205
- Ni films, spin-wave resonance 3=1169
- Ni-Cu films, spin-wave res. 3=1169
- Ni (80%) - Fe (20%) thin film, oxide layer surf. spin pinning 3=1168
- Ni ferrite fine particles 3=1161
- Ni ferrite line width 3=1160
- Ni-Fe ferrite, natural 3=3156
- Ni-Pd films, spin-wave res. 3=1169
- NiZn ferrite, 4.2 and 293°K, 3.2cm 3=6740
- Si iron, linewidth 3=8700
- Y ferrite, noise 3=20631
- Y garnet with rare-earth impurities, anisotropy 3=25558
- YFe ferrite, magnetization precession 3=6738
- YFe garnet, intrinsic relaxation & uniform precession 3=1163
- YFe garnet, main mechanisms 3=3154
- YFe garnet, rel. to induced anisotropy 3=8702
- YFe garnet, rel. to r.f. magnetic field 3=8701
- YFe garnet, spin-wave spectrum anisotropy 3=23209
- YFe garnets, line widths, temp. and freq. depend. 3=23210
- YFe garnets, line widths, temp. var. 3=6721
- YFe garnets, subsidiary resonance suppression 3=18119

Ferromagnetism

- See also Antiferromagnetism; Ferromagnetic relaxation; Ferromagnetic resonance; Magnetic properties, ferromagnetic; Magnetization process; Magnetization state.
- absorpt. of a.c. mag. field, longit., in dielectric 3=8662
- absorpt. of a.c., mag. field. non-reson., in dielectric 3=8661
- alloy, directional order, mag. induced, rel. to superlattice 3=18072

Ferromagnetism — contd

- anisotropy, band theory 3=979
- anisotropy const., calc. for strong anisotropy 3=8658
- anisotropy, effect on spin-wave spectrum 3=20579
- anisotropy energy of uniaxial substs., operator 3=8656
- anisotropy, second const., in cubic crystals 3=13246
- Barkhausen effect, direction, in rotating disk 3=11067
- Barkhausen noise intensity rel. to stress, heat treatment and structure 3=3104
- closure domain structure 3=3106
- coercive field, statistical theory 3=1089
- coexistence with superconductivity 3=16856
- cond. electron polarization, theory, Harwell 3=978
- conducting ferromagnetics, magnetization changes and losses 3=15768
- conductivity, electrical, change on mag. 3=17927
- conference, Leningrad (1961) 3=3086
- conversion of paramagnetics by strong fields, collective electron theory 3=5004
- coupling between acoustic and spin wave modes 3=11043
- crystal lattice statistics, 7 models 3=12910
- crystallographic point groups and macroscopic symmetry in space-time 3=23366
- crystallographic point groups for simultaneous ferroelectricity 3=18069
- crystals, symmetry considerations 3=13233
- cubic, one-particle Green's function 3=3087
- cubic, spontaneous magnetization theory 3=3089
- cubic, static magnetoelastic coupling analysis 3=6701
- cubic, two-dim. time-depend. Green's functions 3=3088
- Curie point, difference with paramag. Curie point 3=1127
- Curie point meas. using a.c. permeability 3=23152
- Curie temp. reduction for small particles 3=20574
- Curie-Weiss constant of metals and alloys 3=13243
- diffusion, activation energy 3=4883
- direct exchange integral for many-electron case 3=980
- disordered ferromag., two-magnon relax. 3=1193
- domain characteristics from n.m.r. 3=8672
- domain obs. by Kerr technique 3=20590
- domains obs. by magneto-optic microscope 3=24010
- domain photography, by transverse Kerr effect 3=17023
- domain structure, effect of external fields 3=8671
- domain structure, short review 3=11070
- domain structure, use in thickness meas., by electron microscopy 3=5400
- domain structures, uniaxial crystal 3=3105
- domains, loosely-coupled, switching threshold calc. 3=13246
- dynamic meas., by damped oscill. fields 3=5804
- Dzialoshinski-Moriya interactions near defects 3=15729
- effect on diffusion 3=22810
- EMU-3 electron microscope modification for domain obs. 3=18415
- electrical resistivity of ferromagnetics at low temp., mag. contrib. 3=15532
- electron beam prod., polarized, on i.r. absorpt., possibility 3=12248
- exchange constant, detm., new method 3=1076
- f.c.c. alloys, mag. induced directional order 3=18073
- f.c.c. lattice, Ising, ordering theory 3=8649
- ferrites, neutron scatt., spin-spin interact. effects 3=25541
- ferromag. Hall effect, theory 3=20275
- ferromag. substs., neutron scatt. 3=3121
- ferromagnetic amplifier, parallel-pumped 3=490
- films, as computer storage elements 3=23175
- films, impulsive magnetization 3=15848
- films, induced anisotropy at low temps. 3=15847
- films, magnetization vector, by crossed-wire r.f. probe 3=6709
- films, magnetostatically coupled, mag. curves, calc. 3=13258
- films, meas. by balance, automatic torque, sensitive 3=14707
- films, Néel wall thickness, quantum theory 3=5015
- films, rotational switching characts., display 3=6708
- films, spontaneous mag., surface anisotropy effects 3=25535
- films, switching, high field 3=15825
- g-factor anisotropy, rel. to magnetization 3=8659

Ferromagnetism — contd

- garnets, solid solution, saturation mag., effect of short range order 3=20616
- general exchange boundary condition and surface anisotropy 3=20568
- Gilbert rel. to Landau-Lifshitz eqns. 3=15772
- Green function theory for general spin 3=13242
- Green's function method with two time consts. 3=25512
- Green's function, thermodynamic, formalism application 3=983
- Hamiltonian, with spin wave-phonon interact. 3=1130-2
- heat conduction by magnon-magnon scatt. 3=10617
- Heisenberg, cluster expansion 3=15763
- Heisenberg, dilute, diagram enumeration 3=13240
- Heisenberg ferromagnet, diagrammatic expansion 3=982
- Heisenberg model, binary kernel formulation 3=13238
- Heisenberg model, dilute, concn. expansions 3=20567
- Heisenberg model, singularity, Padé approx. method 3=5005
- Heisenberg, Padé approximants, application 3=25516
- Heisenberg, short-range order at Curie point 3=11042
- Heisenberg spin systems, two-time Green functions 3=1136
- Heisenberg, thermodynamic behaviour 3=11046
- impurity ferromagnetism, nature 3=15765
- inial, mag. curve for fields perpendicular to preferred direction and parallel to Bloch walls, calc. 3=15796
- insulators, indirect exchange between electrons 3=5003
- interacting spins, ground state Hamiltonian 3=11044
- Ising ferromagnet, use of Green functions 3=11047
- Ising ferromagnet, use of Green functions 3=18068
- Ising model below critical point, Padé approximant 3=11041
- Ising model, combinatorial aspects 3=25514
- Ising model, Green function summation 3=13241
- Ising model, relax. kinetics, thermodyn. study 3=989
- Ising model, two-dim., spontaneous mag. 3=13239
- Ising systems with long-range forces, stochastic fields 3=23779
- isotropic, with arbitrary maximal spin, Green's functions 3=18064
- linear spin chain with exchange interact. 3=11040
- mag. resistance variation 3=6710
- magnetic image contrast in electron mirror microscopy 3=1066
- magnetic interactions between atoms, review 3=3090
- magnetic scattering of slow neutrons 3=15857
- magnetization, effect of mech. deform. 3=13247
- magnetization energies and distrib. 3=1065
- magnetoacoustic resonance, quantum theory 3=23151
- magnetoelastic effects, effect of compensation 3=25330
- magneto-optical effects, Kerr and Faraday coeffs, polarimetric meas., metals 3=14376
- magnetostatic energies, approx. calc. 3=1064
- magnon interact. with magnons, photons and phonons, instability 3=13291
- magnon-magnon interactions 3=23144
- magnon renormalization near transition temp. 3=15751
- magnon renormalization near Curie point 3=5006
- measurement, from resonance 3=23211
- metallic substs., elec. conduct., anomalies 3=10716
- metals, conductivity, thermal, calc., temp. var. 3=20119
- metals, mag. ground state, transitions theory 3=3094
- metals, rel. to low-temp. elec. conductivity 3=6559
- metals, transition from antiferromag., collective electron treatment 3=13227
- mixed ferromagnetic and ferroelectric phase, after second-order transition 3=23147
- modern theory, review 3=6697
- n.m.r., theory for large nuclei concn. 3=8726
- neutron magnetic diffuse scatt. 3=986
- neutron scatt., slow, polarization effects 3=15861
- nuclear mag. relax. near Curie temp., theory 3=23267
- nuclear spin-lattice relaxation 3=18137
- phonon instabilities, excitation by pumping effects 3=23178
- piezoferrromagnetism, thermodynamic theory 3=25176
- piezo-remagnetism in compressed powders 3=1498
- plates, eddy-current loss due to saturation 3=23149

Ferromagnetism—contd

- prolate spheroid, nucleation, eigenvalue spectrum 3=23148
- rare earth metals, 4f shells, indirect interact. 3=3076
- in Rayleigh region, characteristic magnitudes 3=3108
- relaxation phenomena, Green's function method 3=987
- residual mag., surface defect fields 3=11039
- review of Soviet work since 1958 3=1135
- s-d interactions, Green functions theory 3=11045
- s-d model, dynamical effects 3=986
- in semiconductors, crystallochemical model 3=20565
- semiconductors, spontaneous Hall effect, theory 3=22918
- sheets, thickness depend., meas. and theory 3=11077
- single-domain particle system, anhysteretic suscept. 3=1144
- single-domain particle, thermal fluct. 3=15762
- small particles, spontaneous magnetization, theory 3=3113
- sound absorption in dielectrics, theory 3=22654
- space groups; tables 3=1099
- spin collective motion, finite temperatures 3=20571
- spin configurations coupling by anisotropy 3=3091
- spin diffusion theory, on basis of irreversible processes 3=988
- spin interactions between magnetic ions or nuclei in metals 3=8652
- spin-wave impurity states, theory 3=15764
- spin-wave method, generalization to finite temps. 3=18070
- spin wave—phonon interactions in mag. films 3=20569
- spin-wave population, transient growth 3=18066
- spin-wave quantum theory, review 3=15766
- spin wave scatt., in ferromag. resonance 3=25555
- spin-wave spectrum, noncond. ferromag-sphere 3=15761
- spin-wave theory, based on collective electron model 3=25517
- spin wave theory for anisotropic cubic mag. 3=18067
- spin wave theory, rel. to boson theory 3=13234
- spin wave theory using grand partition function 3=8651
- spin wave theory, kinematical interaction 3=1137-8
- spin wave theory, ladder diagrams 3=13235
- spin wave theory of planar structures 3=25515
- spin-wave theory for thin films 3=15827
- spin waves, Bloch—Dyson theory, magnon annihilation operators 3=5002
- spin-waves, boundedness, Fermi operators 3=11048
- spin waves in magnetically complex lattices 3=3093
- spin waves, with s-d exchange interaction, theory 3=8650
- spins, collective motions spin-wave freq. rel. to temp. 3=984-5
- splittings, low-temperature, theory 3=18065
- statistical theory, linked cluster expansions 3=6698
- Suhl—Nakamura interact., effect on n.m.r. 3=20670
- superconducting ground state 3=19094
- and superconductivity 3=9672
- superstructure formation 3=1350
- theory based on Green's functions 3=15767
- theory, system of spins $\frac{1}{2}$ coupled by exchange 3=25513
- thermal screening 3=20593
- thermodynamic props., Green's, for isotropic, with arbitrary spin 3=8648
- thin films, domain wall inclination 3=1078
- transition elements, direct exchange theory, suitability 3=981
- transition from antiferromag., critical field 3=25499
- transition metals and alloys, permanent moments 3=2755
- translational inertial spin effect 3=3711
- weak, existence condits. and weakly ferromag. structure class. 3=6696
- weak, in antiferromagnetic crystals 3=6728

Fibres

- Capron, tensile strength, rel. to double refraction 3=23045
- capron, tensile strength, rel. to molec. wt. 3=16003
- eye, retina, artificial 3=11626
- fibrous materials, bibliography 3=13102
- nylon filaments as capillary cores 3=21180
- polyacrylonitril, mech. props., temp. depend. 3=23358
- polycaprolactame, mech. props., temp. depend. 3=23358
- polyethylene, ion bombardment etching 3=23497
- polyethylene, linear, orientation determ. 3=11307
- polyethylene terephthalate, dynamic elastic moduli 3=8754

Fibres—contd

- polyethyleneterephthalate, mech. props., temp. depend. 3=23358
- polyethylene terephthalate, structure 3=18372
- polymers, structure, by light scattering 3=16127
- polypropylene, mech. props., temp. depend. 3=23358
- polypropylene, tensile strength, rel. to double refraction 3=23045
- pore volume internal 3=13551
- in preferred orientations, X-ray evaluation 3=18400
- profile measurement 3=11647
- rubber, natural, 1000 A-thick films, rel. to irradiation 3=20919
- surfaces, preparation 3=16474
- X-ray crystallography, specimen holder 3=13432
- S_h structure, atomic 3=18371
- SiO₂, periodic structure 3=18370

Field theory, classical

- See also Electromagnetism; Gravitation; Relativity.
- action principle application 3=9324
- causality and multiply-connected space time 3=20
- compensating 3=16494
- "form factor", depend. on Biot boundary condition 3=21207
- general covariant, conformal invariance 3=16493
- generalized "cross-correl." field quantities 3=21203
- Newton integral transform, inversion 3=1583
- Petrov types of vacuum metric, theorem 3=3713
- potential fields, vertical derivatives, second order, numerical calc. methods 3=18696
- potential, second-order vertical deriv. calc. 3=14000
- relativistic spinning electron, quasi-classical theory 3=1585
- spin, Thomas's classical theory 3=5329
- spinning particle, macroscopic motion 3=2094
- theories based on linear Lagrangian, coupling eqns. 3=3710
- unitary field models, instability of radial solns. 3=21206

Field theory, quantum

- See also Dispersion relations; Fundamental particles; Physics fundamentals; Quantum theory.
- almost conserved current hypothesis and PS-PS meson theory 3=7795
- antisymmetrization of wave functions, nuclear systems 3=19540
- asymptotic field operators 3=49
- asymptotic operators rel. to regular perturb. 3=24579
- axiomatic LSZ theory, perturbation expansions 3=24578
- baryon number conservation, use 3=22058
- Bethe—Salpeter eqn., formal soln. 3=7813
- Bethe—Salpeter equation, ground-state, instability criterion and superconductivity 3=5578
- Bethe—Salpeter eqn., in non-relativistic theory 3=41
- Bethe—Salpeter eqn., partial wave 3=12405
- Bogolyubov method, "surface" divergences 3=14851
- Bogolyubov method, Tomonaga—Schwinger equation 3=1636
- Borchers class of a free field 3=7757
- Borchers' theorem generalization 3=11690
- Born series divergence, rel. to quasiparticles 3=17194
- boson field, scalar, 2- and 3-point functions 3=5910
- broken symmetries and massless particles 3=23787
- canonical commutation relns., uniqueness 3=14028
- causality conditions, Wightman problem 3=4314
- charged particle scattered wave phase shift 3=2225
- clothed operators and commutivity condition 3=5912
- combined e.m. spinor field eqns., exact soln. 3=10088
- commutation relns., rel. to conservation laws 3=10013
- complex ang. momentum in perturb. theory 3=19579
- composite and elementary particles, distinction between 3=547
- configurational space as finite no of points 3=24601
- coupling constant, magnitude, restrictions 3=24048
- coupling const. restriction by S-matrix props. 3=10062
- coupling constant strength and vacuum stability 3=7761
- coupling constant, upper limits, analytic expressions 3=24649
- covariant theories with indefinite matrix 3=12384
- decays γ_s —symmetry, with $\Delta S = -\Delta Q$ 3=24626
- $\Delta S = \pm \Delta Q$ rule, rel. to K_L decays 3=602
- density matrix eqn. of motion, perturbation soln. 3=17226
- Dirac equation and boson fields 3=5930

Field theory, quantum — contd

- Dirac field, massless, rel. to elem. particles 3=7772
- Dirac operators, commutation rules, in Kastler's spinor field 3=14863
- Dirac space, math. foundation 3=14860
- electromagnetic interactions of massless particles 3=551
- electron—phonon system, coupled 3=20084
- elementary particle classification 3=22056
- elementary particles, unified theories, development 3=12382
- energy density commutator condition 3=12387
- eqn. of state at ultra-high densities and relativistic limitations 3=3528
- equivalence of 3 scalar theories of 3 scalar particles 3=22059
- equivalence theorems, point transformations 3=12421
- expectation value formalism 3=7782-3
- fermions, mass, in γ_5 invariant theory 3=22063
- Feynman amplitudes, high-energy behaviour 3=17212
- Feynman amplitudes, high-energy behaviour 3=24638
- Feynman amplitudes for nonrelativistic processes 3=14867
- Feynman amplitudes, singularities 3=24610
- Feynman diagram contributions, analytic props. 3=14865
- Feynman diagram, singularity positions 3=5927
- Feynman diagrams containing Regge poles 3=24661
- Feynman diagrams, majorization, Symanzik's theorem 3=5958
- Feynman diagrams, "many-tail" type, closed loops, analytic props. and amplitudes 3=14866
- Feynman graph amplitudes, "many-tail", invariant variables 3=5935
- Feynman rules for Regge particles 3=24658
- field-metric theory, baryon—meson mass spectrum 3=7787
- fields in momentum space 3=48
- fields with persistent one-particle states 3=535
- five-point function, reduction formula 3=14020
- Foldy—Wouthuysen transform., extension 3=5362
- forced harmonic oscillator, S-matrix solution 3=14032
- four-dimension group of isospin and hypercharge 3=5909
- Fourier transform rel. to Bergmann—Weil integral for 3-point function 3=5321
- free character of fields, criterion for 3=4307
- free-field eqns., group props. 3=12398
- fundamental fields in quaternion theory 3=16524
- gauge invariance in axiomatic approach 3=5908
- gauge invariance, rel. to scatt. integr. rules 3=24585
- gauge invariance, Yang—Mills theory 3=17186
- generalized, appl. to baryon spins and charges 3=24603
- graviton of spin 2, 1, 0, from electron inertial tensor 3=28
- Green functions, nonsymmetric u. v. asymptotic expressions 3=24624
- group theory, mathematical basis of physical techniques 3=4308
- Hamiltonian formalism, relativistic, and micrononcausality 3=24580
- Hartree—Fock, for semi-infinite medium 3=10434
- Heisenberg field, definition, arbitrariness 3=12407
- Heisenberg fields, completeness identity 3=46
- high-energy physics, Geneva, (1962) 3=7815
- Hilbert space, fields of 2nd kind, T and CP invariance 3=7111
- Hilbert space, new definition, renormalization 3=21233
- interaction Hamiltonian 3=4355
- interpolating field, determination ambiguity 3=4356
- isobaric spin space 3=22060
- Jost function, generalized, rel. to Levinson reln. 3=10061
- ladder diagrams, investigation by complex angular momentum method 3=14893
- $\lambda \Phi^4$ theory, Regge trajectory 3=24656
- Lee model, ghost state elimination 3=2194
- Lee model, Lorentz covariant 3=5911
- Lee model, Lorentz-covariant, field theory deriv. 3=12384
- Lee model, trivially modified, bound states and dispersion relations 3=5947
- Lee model, with two V particles, renormalization 3=4312
- Lie groups of rank 2, mass relations 3=19549
- Lie groups, simple and Wigner—Eckart theorem 3=17177
- local invariance, compensating-fields theory 3=14021

Field theory, quantum — contd

- Lorentz gauge formulation for non-Abelian fields 3=10019
- Lorentz group, homogeneous infinitesimal operators, method 3=13
- Lorentz group represent. for unstable particles 3=24595
- matrix elements, theory of quantized field of probability ampl. 3=11692
- mechanical model with harmonic oscillators 3=12410
- "minimal" analyticity, unitarity, consequences of 3=10011
- model, Low eqn., dynamic resonances 3=7760
- models, Green's function infrared asymptotics 3=2183
- multiperipheral equations, structure 3=12415
- Newton—Wigner coordinate for scalar particle 3=7755
- nonrelativistic diags. analytic props. 3=5966
- nonrelativistic fictitious quasi-particles 3=12395
- nonrenormalized theories, ultraviolet divergences 3=2184
- observable consequences of anomalous thresholds 3=24593
- operator equations for Foldy—Wouthuysen transformations 3=10065
- paramag. crystal, spin—spin interact. via phonon fld. 3=6756
- partial waves with complex orbital momenta rel. to scattering amplitude 3=4357
- particle description not using asymptotic free fields 3=2189
- particle interaction amplitudes, singularities 3=4352
- perturbation theory, axiomatic, partial sum formalism 3=12385
- perturbation theory, internal representations 3=14850
- perturbation theory, 2nd-type singularities 3=7814
- perturbation theory; square diagram with decay masses, props. 3=569
- perturbative expansions, renormalized, asymptotic convergence 3=5967
- poles, existence in unphysical sheet 3=10015
- quantized probability amplitude theory 3=14019
- quantum mechanics, relativistic, path integral formulation 3=11691
- quantum-relativistic, for interacting fields, macroscopically causal, possibility 3=11686
- quasi-optical approach to scattering 3=24577
- Regge parameters, dispersion relns. 3=12426
- Regge poles and perturbation theory 3=14891
- Regge trajectory in ladder approx. 3=7759
- Regge trajectory, restrictions by maximal analyticity 3=21250
- regularization method using counterfields 3=7758
- relativistic, axioms, nature and interdepend. 3=22049
- relativistic eqn. of motion of spin 3=5914
- relativistic eqn. of motion, translational 3=5913
- relativistic, exact soln. 3=14847
- renormalization group, completeness 3=10012
- renormalization, Kemmer scalar symmetric model 3=5936
- retarded n-point functions, axiomatic perturb. theory 3=5910
- retarded and time-ordered products 3=9322
- ρ -space, constant curvature 3=7756
- scattering matrix, relativistic invariant parametrization 3=5963
- sequences, distributions and spaces 3=3705, 10016
- shifts, in constant curvature space 3=24581
- singularity at vanishing coupling constant 3=7763
- S-matrix, contrib. to space-like intervals 3=2219
- space-time approach to particle trajectories 3=14848
- space—time discontinuum in $h-c-l_0$ theories 3=9328
- space—time transformations, conformal 3=3712
- spectral function eqn., three-particle state contrib. 3=5969
- spin translation in Lobachevsky space 3=17183
- spinor eqns., non-linear, in twisted space 3=4332
- spinor field, propagators and commutators 3=3733
- spinor fields in generally covariant theories 3=10025
- spinor theory, non-linear, variational method 3=17181
- spinors, generalized theory 3=4329
- state vectors, unified representation 3=4313
- superconductor, collective excitation 3=1897
- superselection, charge, from random electromagnetic interactions 3=12399
- SU₃ symm. and ninth vector meson 3=24612
- symmetry breakdown in nonperturbative solns. 3=5925
- symmetry characters, explicit eigenfunction props. 3=2200
- symmetry model for the new resonances 3=554

Field theory, quantum—contd

- T and T* as opposite boundary values 3=12386
 t-matrix singularities after canonical transformation 3=10053
 three-particle unitarity condition, diagrams 3=5970
 turbulence, decay, applic. 3=5412
 two-channel reactions, simple model 3=14886
 ultraviolet divergences in Feynman diagrams, removal 3=12401
 unified representation for elementary particles 3=17176
 unitarity and causality with unstable particles 3=10014
 unitarity and high-energy inelastic scatt. 3=560
 unitarity, rel. to high-energy scattering 3=7802
 unitary symmetry, weak interactions 3=22072
 unitary theories, anomalous thresholds 3=4311
 vacuum expect. values, truncated, rel. to particle interact. 3=14846
 vacuum state 3=22048
 vacuum trajectory, structure 3=7762
 vector fields interacting with Dirac's current 3=548
 vector gauge field, rel. to nonzero mass 3=5919
 vertex function, analyticity 3=14890
 vertex functions of NN_π , $\Delta N\bar{K}$ and $\Lambda K\pi$ 3=19555
 wave equations, two-component first-order, from Feynman-Gell-Mann eqns. 3=5968
 weak decays and final-state interactions 3=17161
 Wightman, relativistic, structure 3=24575-76
 without operators 3=19538
 ξ -limiting process, appl. to intermediate bosons 3=553
 ξ -limiting process of Lee and Yang 3=552
 Yukawa potential, Regge poles and asympt. behaviour of amplitudes in perturb. theory 3=21249
 $\nabla^2\psi - \psi + \psi^3 = 0$, approx. solns. 3=12393
- electromagnetic field.**
 See Quantum electrodynamics.
- interactions**
 See also Fundamental particles; Nuclear interactions.
 Entries on interactions involving named particles are listed under the particles concerned.
 $a + b \rightarrow c + d + e + \dots$, relativistic theory 3=4337
 Adair spin analysis with parity nonconservation 3=2229
 amplitude of production of 3 low-energy particles 3=550
 analyticity of square diagram 3=17185
 baryon number conservation, Jost-Lehmann-Dyson represent. 3=7786
 boson-fermion doublets interact., renormalizations 3=22068
 boson resonances, symmetry model 3=554
 classification, rel. to boson χ 3=555
 complex ang. momentum, algebraic problems 3=24660
 coupled two-particle channels, resonances 3=10040
 coupling constant, unstable particle 3=5923
 coupling constants of composite particle 3=19551
 and coupling schemes in nuclei 3=6123
 decay processes, multipole expansions 3=24625
 delta-function potential in box 3=7117
 effective particle interaction radius 3=5974
 elementary particles in isospace $\mathcal{H}(R_3^2)$ 3=24598
 electromagnetic, soft π emission 3=595
 e.m., between spin- $\frac{1}{2}$ particles with structure 3=7875
 e.m., parity, rel. to Dirac monopole 3=22054
 final-state interact., transition amplitudes 3=10174
 final state interacts., effect on reaction cross-sections 3=2196
 final state of prod. process, overlapping interact. 3=5934
 4-fermion, unitarity and analyticity investigation 3=14879
 formal similarities between weak, strong and e.m. 3=2195
 Gell-Mann-Okubo mass formula, deriv. 3=14874
 generation of three particles, role of short-range forces 3=14920
 gravitation, interaction picture 3=7099
 group-theory formalism in relativistic theory 3=2203
 group theory, mathematical basis of physical techniques 3=4308
 high-energy, higher symmetries and Pomerančuk conditions 3=5929
 high-energy, props. of "quantum H" 3=6110
 inelastic, asymptotic behaviour, relativistic theory 3=22079

Field theory, quantum—contd

- interactions—contd**
 isobar prod., ρ or K^* exchange model 3=22199
 isobaric resonances 3=12406
 in isospace $\mathcal{H}(R_3^2)$ 3=24599
 isospace symmetries, gauge group, of non-relativistic rotator 3=546
 isotopic spin amplitudes, crossing matrices in isospin 3=12402
 local gauge invariance, vector fields generation 3=12421
 Lorentz covariant analytic functions 3=22053
 majorizing diagram construction from Feynman diagram 3=14864
 Mandelstam representation singularities 3=14865
 mass renormalization conditions 3=14849
 minimal interacts of $s = 0, \frac{1}{2}, 1$ particles 3=24609
 neutrinos, e.m. interact., in interact. with nuclei 3=10085
 non-local theory, high-energy interact. 3=4336
 one-photon exchange processes, radiative corrections 3=7777
 pairing correlations theory 3=23801
 "parity-unfavoured", forward and backward "selection rule" 3=24837
 particles, with intermediate Bose field 3=24607
 physical interpretation of unphysical region 3=22076
 Pomeranchuk and Okun rules, math. implications 3=7784
 potential bet. two nucleons, using Low eqn. 3=15069
 quasi-real processes method, general appl. 3=2193
 relativistic invariance and sq. root Klein-Gordon eqn. 3=7812
 relativistic many-body problems, angular momenta 3=72
 resonances classification and Ball-Frazer formula 3=10036
 resonance reactions, symmetry props. of S-matrix 3=557
 r-structure and T-structure, connection bet. 3=7776
 secondary particle ang. distrib., for 10^{10} - 10^{13} eV reactions 3=17273
 space-time model, real, extended structures 3=4325
 spin $\frac{1}{2}$ particles, ang. momentum poles 3=7803
 superhigh energy, multiperipheral model of particle prod. 3=24615-6
 symmetries shared by strong and weak interacts. 3=22070
 three-particle vertex, limitations 3=14875
 three-particles with point interaction wave-function 3=3751
 two ingoing, three outgoing particles, spinless, invariant ang. functions 3=2208
 two-neutrino theory, approx. symmetries 3=538
 unstable particles, interaction with e.m. field 3=4335
 unitarity and evaluation of discontinuities 3=24629
 unitary symmetry and NN annihilation 3=582
 vacuum degeneracy rel. to isotopic spin 3=12510
 vacuum expectation value of three-point function 3=7778
 vector meson, charged, interacting with e.m. field, theory 3=552
 weak-strong relation, by general covariance 3=10032
- interactions, strong**
 baryon-baryon and baryon-antibaryon, rel. to SU_3 symmetry 3=24612
 baryons, fourth-order contrib. to self-energies 3=537
 baryons and resonances, internal degrees and mass quantization 3=22065
 baryons, new symmetry replacing strangeness 3=5931-2
 bootstraps and the pion-nucleon system 3=24613
 Cayley octonians 3=10031
 coupling consts., considering Y^* 3=19550
 coupling constants, using unsubtracted dispersion relns. 3=4342
 doublet theory for differing parities 3=17184
 eightfold way, baryon-baryon interactions 3=24604
 final states, overlapping resonances effect 3=17195
 fragile symmetry 3=10034
 free-field eqns., group props. 3=12398
 gauge invariance for neutral massive vector field 3=14888
 global symmetry, possible group schemes 3=14868
 group theoretical dynamical model 3=2192
 isotopic spin conservation, upper limit 3=15046
 isotopic spin indep. in high energy limit 3=7808

Field theory, quantum — contd**interactions, strong — contd**

- K* resonance, dynamical model 3=19577
 Λ - Λ potential, due to π exchange, fourth order 3=19707
 Lie group B, 7-dimensional scheme 3=12397
 Mandelstam's programme in potential scatt. 3=10039
 model, phenomenological 3=7853
 Ne'eman-Gell-Mann theory, resonance decays, relative weights 3=22073
 N/D calc. of Pomeranchuk and ρ -Regge trajectories 3=15019
 N-N, high-energy, range, single-channel model 3=19620
 n-p weak current, renormalization effects 3=7862
 nucleon-meson field, Green functions 3=24605
 nucleon and (3,3) resonance, "bootstrap" relationship 3=7841
 octet model, baryon charge and R-inversion 3=7785
 octet symmetry, spontaneous breakdown 3=14869
 parity conservation, rel. to $\text{Be}^7(n,\alpha)\text{He}^4$ 3=17480
 particle systems with hypercharge $Y=0$, symm. 3=556
 p-N and p- π , energy losses 3=17274
 π -N and ρ -N, S-matrix theory, scatt. and production amplitudes 3=562
 R-invariances 3=12400
 R_8 subgroups, particle charge symmetries 3=19548
 rel. to potential scattering model 3=12413
 renormalized, inelastic high-energy particle scatt. 3=22067
 resonances, review of expt. data 3=24670
 resonances as Sakata model bound states 3=5928
 scattering, elastic, 2-20 BeV 3=7911
 S-matrix theory, no particles fundamental 3=567
 strong damping of large momentum transfers 3=14897
 SU(3) group, 10-dimensional rep. 3=4459
 symmetry induction mechanism 3=22071
 symmetry multiplet structure 3=17196
 TCP theorem, proton-antiproton test 3=2264
 time-reversal invariance, test, Sc^{47} decay, period and γ mixing ratio 3=24893
 triple ang. correl., β - γ - γ , time reversal test 3=10033
 unitary symmetry, exptl. verification 3=7788
 unitary symm., mass formula generalization 3=24621
 unitary symm. model, possible higher resonances 3=24622
 vector nature, possible quantitative test 3=24627

interactions, weak

- baryon currents, neutral, rel. to hyperon single production 3=6085
 baryon-pion, Lagrangian with S, T and P types 3=24619
 composite model with two neutrinos 3=7779
 "conservative vector current", experimental confirmation 3=12403
 conserved vector current theory, for β -decay 3=6195
 conserved vector current theory, test from $\Sigma^- \rightarrow \Lambda + e + \nu$, 3=7933
 coupling const. variation, rel. to radioactive decay ages of rocks and meteorites 3=7017
 CP invariance and antiparticles concept 3=24623
 decay ($\Delta S/\Delta Q = -1$) and "induced transition" 3=10035
 decay processes mediated by vector bosons, radiative corrections 3=2228
 $\Delta S=1$ currents, structure, rel. to Kr^4 decays 3=7918
 effects on e.m. props. of Leptons 3=24600
 e.m. corrections in beta-decay theory 3=12404
 e.m. corrections, calculations 3=4338
 e, μ , prop. similarities 3=17297
 Feynman-Gell-Mann equation in spinor space 3=24592
 four-fermion, restrictions 3=7780
 fundamental particle relativistic rotator model 3=19542-3
 γ_5 -symmetry, with $\Delta S = -\Delta Q$ 3=24626
 high-energy, rel. to K-meson leptonic decay 3=6062
 higher-order effects, vector meson theory 3=24620
 higher symmetries and current conservation 3=14870
 in isospace $\mathcal{H}(R_8^5)$ 3=7781
 intermediate boson theory with parity clash 3=19552
 intermediate bosons, W^\pm , e.m. props., appl. of ξ -limiting process 3=553
 Lagrangians violating the $|\Delta I| = \frac{1}{2}$ rule 3=22069
 Lee model, dressed particle picture 3=12383
 leptons and baryons, with intermediary mesons 3=22061
 leptons, Lagrangian form 3=4359
 mass-doublet model, symmetrization, inversion and chirality 3=17190

Field theory, quantum—contd**interactions, weak—contd**

- mediation by Regge particles 3=24608
 μ , e, prop. similarities 3=17297
 neutrino-electron, rel. to e.m. interact. of neutrino 3=10085
 neutrino, 2 kinds, rel. to 6-dimensional manifold systematization 3=12437
 and neutrinos, ang. distrib., Brookhaven 1962 3=19610
 ν absorpt. in Coulomb field of nuclei 3=10086
 PC and PCT invariance test in decay processes 3=24606
 parity, non-conservation 3=17192
 perturbation theory, use of quasiparticles 3=17194
 π softemission 3=595
 pion cloud collective motion, effects 3=19553
 R-invariances 3=12400
 radiative corrections, gauge invariance applied 3=549
 relativistic rotator, gauge group and isospac symmetries 3=17189
 review, recent developments, semipopular 3=17193
 strangeness-changing, from K-meson decay 3=19694
 strangeness-changing vector current, partial conservation 3=17332
 strangeness conserving and changing, theory, contrasts 3=4362
 strangeness violating interacts. 3=6069
 s-wave strength function, "vibrational region" 3=19761
 three-particle emission, relativistic, analysis 3=22066
 two-body, invariant amplitude regularity 3=2201
 unitary multiplet, mag. moments and e.m. differences 3=22074
 unitary symmetry and lepton decays 3=22062
 unitary symmetry theory 3=22072
 unitary symmetry and weak currents 3=24611
 unitary symmetry theory and leptonic hyperon decays 3=22205
 universal Fermi interaction, data from Al^{26} ft value 3=6200
 universal Fermi, rel. to muon capture by nuclei 3=4656
 universal Fermi, rotation and refl. symm. 3=4333
 universal Fermi, testing on C^{12} muon capture 3=8122
 universal model 3=2198
 universal model, incorporating $\Delta S = -\Delta Q$ processes 3=7775
 universal, V-A, μ -meson evidence review 3=24755
 universal weak interact., rel. to unitarity symmetry 3=5959
 unsubtracted dispersion relns. study 3=2197
 vector current conservation, mass diff. in isotopic multiplets 3=24761
 vector current, structure, expt. analysis 3=22163
 vector current structure, exptl. investig. 3=5937
 vector meson, charged, e.m. props. 3=24614
- meson field**
 See also Mesons; Nuclear forces.
 Bethe-Salpeter eqn., partial wave 3=12405
 complex vector field, mass 3=14887
 equivalence of Duffin-Kemmer and Klein-Gordon formalisms 3=17199
 fixed-point scatterer, relativistic scattering, exact theory 3=24640
 K* resonance, dynamical model 3=19577
 Lee model, dressed particle picture 3=12383
 local theory, without ultraviolet 3=19583
 Low eqn. solution properties 3=5964
 magnetic moments of nucleons 3=10104
 meson-nucleon scattering, Regge pole in u channel, contrib. 3=7809
 Nambu model, normal product, Yukawa term 2nd coeff. 3=4340
 nuclear interaction, Green functions 3=24605
 nucleon-nuclear potl. 3=621
 one-pion exchange, nuclear structure 3=622
 one-pion exchange and optical model, corrections 3=12419
 pseudoscalar, asympt. behaviour of vertex part 3=12479
 π -meson Green's function, by dispersion relns. 3=24666
 π -d, elastic, 142 MeV, form-factor approx. 3=22180
 π - π scattering, low-en. eqns., solutions 3=6056
 PS-PS meson theory and almost conserved current hypothesis 3=7795
 ρ and ω particles, rel. to π decay 3=15001

Field theory, quantum—contd

meson field—contd

- radiation damping theory, classical limit 3=7806
- scalar field, in Jordan-Thiry theory 3=23759
- singularities of the scatt. amplitude 3=14912
- three relativ. pions, ang. momentum wave functions 3=4348
- two-meson approx., soln. of linear integral eqns. 3=5946
- vector, longitudinally polarized, wave-functions, matrix elements, calc. 3=22154
- vector meson, charged, e.m. props. 3=24614
- vector mesons in relativistic rotator theory of elementary particles 3=14884
- vector particles, mag. moment and photoprod. 3=5973
- Yukawa potentials, complex 3=4339
- Yukawa potential, energy levels 3=3746
- Yukawa, Regge trajectories 3=19568
- Yukawa potential, scatt., Regge pole trajectories 3=22092

quantization

- See also Quantum theory, quantization.
- commutativity, local 3=9350
- conditions for agreement with special relativity 3=4315
- electrodynamical field, for photon rest mass 3=536
- e.m. field 3=7765
- expanding universe, gravitational field 3=11503
- formal and physical aspects 3=7120
- fundamental particles, unusual statistics 3=7816
- generalization for interacting fields 3=12388
- gravitational field, gauge conditions 3=11679
- Heisenberg's nonlinear theory 3=1613
- infinite-dim. invariance groups, generalized Schwinger-Feynman theory 3=5357
- non-relativistic rotor, rel. to zero-strangeness particles 3=2186
- phase space, second quantization, and Wigner distrib. function 3=4316
- probability-amplitude theory, state vector quantization 3=5361
- Scalar model in quantized space-time 3=14852
- space-time quantization, theory 3=4310
- variation method appl. to simple field 3=10017
- Zachariasen model, rel. to ghost states 3=4309

Films

- electron scatt., calc. 3=20153
- e.m. wave propag., rel. to polarization 3=1838
- formed by polyvinyl alcohol and Cu^{++} salt reaction, concentrated solutions 3=16163
- gas, in powders, rel. to convection 3=3907
- ideal gas, "wedge pressure" 3=1723
- magnetic, spin wave-phonon interactions 3=20569
- monomolecular, to prevent water evaporation 3=24114
- sputtered, adhesion, greater than evaporation, mechanism 3=23505
- thickness meas., to better than 1 Å, by interference microscope 3=18772
- thickness meas. with interference microscope 3=11746
- thickness meas. by interferometer, reflectors, three layer, TiO_2 , SiO_2 3=16793
- thickness meas., optical method, non-destructive, 0.1-10 mils 3=14087

liquid

- See also Adsorbed layers; Contact angle; Helium, liquid; Superfluidity; Surface tension.
- condensation, in forced boundary-layer flow 3=300
- foam, black, structure and stability 3=9433
- liquid, u.s. atomization 3=23850
- silicone oil, insulation 3=21388
- spreading on Zn, effect of surface texture, for Hg 3=5427
- He II, flow at low pressure heads 3=313

solid

- See also Optical films; Thickness measurement.
- adsorption, desorption and catalysis rel. to irrad. 3=6896
- alkali antimonides, 200 Å thick, resistance rel. to formation time 3=25351
- alkali metals, absorption light, selective photoelectric effect 3=20466
- alkali metals, structure, elec., and optical props. 3=18385-92
- alloy foils, aged, precipitation rel. to dislocations 3=20894

Films—contd

solid—contd

- amorphous, electron scatt., rel. to electron microscopy 3=9866
- anodic oxide Ta, structure 3=3355
- apparatus for evap. of metals and dielectrics 3=5148
- benzene, crystalline, i.r. spectrum 3=13191
- Canada balsam, thickness meas. 3=9395
- capacitor-like devices, electron emission 3=12230
- carbon, prep. for electron microscopy 3=16137
- characteristic electron-energy losses, meas. 3=5712
- collodion, thickness meas. 3=9395
- corrosion layers, on In-Pb and Fe-Ni alloys, structure 3=20913
- cryolite, structure from optical consts., adsorption formation theory 3=13560
- deposition, multiple, masking jig 3=13983
- dielectric, deposition and behaviour 3=16898
- dielectric and metallic layers, prodn. 3=11315
- diffusion of superconducting backing 3=22805
- elastic props., dynamic, supported films 3=23284
- electron diffraction examination, apparatus 3=6901
- electron energy losses in, Coulomb collisions 3=24371
- electron scattering, inelastic, by thin films 3=2781
- electron scattering, inelastic, rel. to dielectric const. 3=20962
- epitaxial, similarity between Ag, Au, Cu 3=23506
- epitaxial, thickness meas. by i.r. interference 3=1650
- evaporated, as electric hygrometer elements 3=1425
- evaporation, vacuum, sources, reflection 3=16135
- evaporator for ultra-high vacuum range 3=23954
- extensometric properties, rel. to substrate 3=15980
- ferrite, chemical deposition and mag. props. 3=16141
- ferromag., domain structure 3=1149
- ferromag. resonance 3=1062
- ferromag., two, coupling of magnetizations 3=3111
- ferromagnetic, anisotropy 3=20604
- ferromagnetic, anisotropy meas. method 3=12284
- ferromagnetic, anisotropic, permeability, theoretical and exptl. investigation 3=11078-9
- ferromagnetic, coercive force rel. to impurities 3=15824
- ferromagnetic, coercivity and domain structure, rel. to temperature 3=15813
- ferromagnetic, coupled films, various mag. props 3=15844
- ferromagnetic, domain boundaries, mag. field effects 3=20594
- ferromagnetic, domain wall inclination 3=1078
- ferromagnetic, domain wall motions, electron micros. photography 3=23167
- ferromagnetic, domain walls and switching, obs. 3=20597
- ferromagnetic, electron microscopy of edges and cracks 3=13580
- ferromagnetic, elec. res. rel. to mag. fld. 3=6710
- ferromagnetic, exchange constant, detm., new method 3=1076
- ferromagnetic, hysteresis meas. 3=24424
- ferromagnetic layers, magneto-optical investigation 3=18092
- ferromagnetic, low-lying spin wave modes 3=11075
- ferromagnetic, mag. interactions, induced by strip line fields 3=15820
- ferromagnetic, mag. process, freq. var., from Kerr magneto optical effect 3=25536
- ferromagnetic, magnetization vector, by crossed-wire r.f. probe 3=6709
- ferromagnetic, magnetoresistance meas. 3=14470
- ferromagnetic, meas. by balance, automatic torque, sensitive 3=14707
- ferromagnetic, orientation by deformation 3=20598
- ferromagnetic, paramagnetic behaviour above Curie point 3=20607
- ferromagnetic, preparation and magnetization 3=8674
- ferromagnetic, relaxation time 3=15923
- ferromagnetic resonance, tables, review 3=21374
- ferromagnetic, rotational switching characts., display 3=6708
- ferromagnetic spin-wave resonance 3=15921
- ferromagnetic, spin-wave theory 3=15827
- ferromagnetic, spontaneous magnetization 3=25533

Films—contd
solid—contd

- ferromag., spontaneous mag., surface anisotropy effects 3=25535
ferromagnetic, surface anisotropy energy 3=15841
ferromagnetic, switching, high field 3=15825
ferromagnetic, switching speed rel. to mag. fld. 3=23173
formation in ionization gauges, chemical removal 3=23949
growth, in drops of solns. and melts, velocity 3=25669
growth, rel. to crystal bonds 3=16132
hexamethylbenzene, conductivity rel. to crystalline transition 3=10873
Inconel-X, electron microscope obs. 3=20872
insulating, bet. electrodes, intrinsic fields 3=8543
insulating, between electrodes, elec. tunnel effect 3=23010
insulating, effect of thickness nonuniformity on tunnelling 3=23011
insulating films, electron transport mechanisms 3=6611
insulating, separating 2 films, electron tunnelling, rel. to superconducting 3=16869
internal friction, meas. 3=15975
Kerr magneto optical effect 3=15654
layer on disperser cathode, activated 3=12235
mag., coupled, mag. curves, calc. 3=13258
magnetic analysis by electron diffraction 3=5014
magnetic anisotropy, angular and magnitude dispersion 3=11083
magnetic anisotropy fields meas. methods 3=4240
magnetic, B-H charact., coercivity rel. to driving field 3=23157
magnetic, differential susceptibility 3=23170
magnetic, direct obs. of magnetization reversal 3=14711
magnetic, dispersion angle meas. 3=25534
magnetic domain structure obs. by Faraday effect 3=15806
magnetic dynamic characteristics 3=15817
magnetic, matrix, for computer store 3=4248
magnetic memory device, thick-film 3=14733
magnetic 90° curling of magnetization 3=15834
magnetic, pulsed field calc. 3=24426
magnetic, ripple hysteresis 3=23172
magnetic, spin-wave resonance 3=1167
magnetic, study using uniform dephasing 3=9901
magnetization, rel. to pinning of surface spins 3=15838
mass-thickness meas., by electron scattering 3=21280
metal, adhesion to crystal faces 3=23504
metal, adsorpt. and decomp. of hydrocarbons 3=20939
metal, cond. electrons m.f.p., scatt. parameter 3=15546
metal, conductivity, electrical, support effects 3=22901
metal, cyclotron resonance, model 3=6504
metal, discontinuous, elec. conduction 3=10724
metal, electric and magnetic properties, conference, Liège (1961) 3=13029
metal, electrical conduction mechanism 3=15536
metal, electrolytic prep. 3=11649
metal, evaporated, sorption props., conference Liverpool 1963 3=25778
metal, f.c.c., formation of twins 3=20780
metal, ferromag. resonance, rel. to superficial and deep layers 3=23206
metal foils prodn., electroplating technique 3=20933
metal—insulator—metal, electron tunnelling time 3=1611
metal layered structures, X-ray diffr. 3=23437
metal, low-energy electrons anomalous transmission 3=14660
metal, optical absorption 3=15666
metal oxides 3=20884
metal, phenomena at low temps. during deposition 3=3358
metal, photoelectric emission and electrons and holes, hot, m.f.p. 3=20264
metal, plasmons interact. with radiation 3=12952
metal, on rock salt, growth twins 3=18238
metal on semiconductors, barrier height studies 3=25387
metal, stresses, internal, electron diffr. contrast microscopy 3=20702
metal, structure and superconductivity 3=16133
metal, surface potential of adsorbed gases, changes, meas. by static capacitor 3=9824
metal, suspended, prod. 3=23503

Films—contd
solid—contd

- metal, temperature rise, rel. to electron irradi. 3=17807
metal, very thin, electrical conductivity, rel. to gas adsorption 3=15549
metallic, evap. on quartz, photoelec. sensitivity 3=6626
metallic, thickness rel. to coercive field for wall motion 3=20603
metals, absorption, light, oxidation and wavelength effects 3=17991
metals, evaporated, surface structure, by electron microscopy of replicas 3=13559
metals, f.c.c., polycryst., origin of stacking faults 3=2813
metals, f.c.c., on oriented Ag, Pd, Ni films, structure 3=1371
metals, fission fragment damage 3=17802
metals foils from rolled material, prep. and tensile testing 3=5073
metals, growth, effect of surface energy on crystallite size 3=16134
metals with high m.p., prep., props. 3=11316
metals, lattice strain and crystallite size 3=20932
metals, noble, monovalent, absorption, light, influence of substrate expansion 3=6649
metals, optical consts. rel. to wavelength 3=10902
metals, plasma resonance absorpt. 3=10634
metals, refractory, vacuum deposition, using spring-loaded conductors 3=9524
metals, resistance, electrical, and work function, effect of adsorption of electropositive atoms 3=13040
metals, spin resonance, d.c. detection 3=15934
metals, X-ray prod. efficiency, rel. to X-ray microscopy 3=6902
Mössbauer effect 3=20060
multilayer, resonance diffraction of light 3=3891
multiple film deposition, masking jig 3=13983
narrow strip deposition by evaporation 3=6885
Nichrome, vacuum dep., strain sensitivity 3=23514
normal metal, on supercond. film, transition temp. 3=5583
nucleation of vapour deposits 3=1873
optical constants, meas. in vacuum 3=13147
optical density, metallic vapour distrib. 3=20934
organic, photoconductivity, ~1 μ thick 3=25420
organic, prep. for vacuum evap. on to it 3=25773
oxide films on Si, optical props. 3=25439
oxide formation on Mg crystal faces 3=23512-13
oxide on metal crystals, kinetics, formulation and numerical solutions 3=25775
oxide, high purity, vacuum deposition method 3=23955
oxide, space charge rel. to growth rate 3=10867
para-halogeno-styrene, amorphous, electron-diffraction study 3=1368
Permalloy, domain structure changes 3=18088
Permalloy, domain structure and preferred-axis dispersion 3=15812
Permalloy, effective magnetization, anisotropy 3=20596
Permalloy, effect of prep. conditions on mag. anisotropy 3=11086
Permalloy, evaporation decoration of cleaved NaCl 3=20931
Permalloy, ferromag. resonance 3=20633
Permalloy, ferromag. resonance absorpt. 3=11105
Permalloy, ferromagnetic resonance 3=15917
Permalloy, ferromagnetic spin pinning 3=15839
Permalloy, ferromagnetic spin-wave resonance 3=15922
Permalloy, on glass surface, rel. to line structure 3=18375
Permalloy, homogeneity investigation, by ferromagnetic resonance 3=18393
Permalloy, longitudinal Kerr magneto-optical permalloy, longit permeability 3=15831
Permalloy, mag. anisotropy 3=11057
Permalloy, mag. anisotropy and hysteresis 3=15837
Permalloy, magnetic anisotropy dispersion and error function 3=20601
permalloy, mag. easy axis, max. dispersion 3=15808
Permalloy, mag. flux reversal by Neel wall motion 3=15845
permalloy, mag. props. rel. to method of prep. 3=1073
Permalloy, mag. props. of very thin films 3=15832
Permalloy, magnetic props., effect of surface roughness 3=15840

Films—contd

solid—contd

- Permalloy, magnetic properties rel. to added Cu and Co 3=15816
- Permalloy, magnetization process, rel. to dispersed anisotropy 3=15811
- Permalloy, magnetoelastic sensitivity 3=15842
- Permalloy, regional variation of anisotropy in ferromagnetic resonance 3=25556
- permalloy, resistivity and coercivity 3=13041
- permalloy, resonance linewidth and anisotropy, var. 3=13257
- Permalloy (78,83) mag. anisotropy, 1 Mc/s 3=15828
- Permalloy, spin-wave resonance 3=15920
- Permalloy, sputtered, structure and magnetic anisotropy 3=15819
- Permalloy, structure, effect of growth conditions 3=16047
- Permalloy, structure and M-induced anisotropy rel. to minor constituents 3=1074
- permalloy, torque, angular dependence 3=1071
- Permalloy, transverse magnetization 3=18087
- Permalloy, various types of mag. film, props. 3=15836
- permeation through polymer film, anomalous 3=1679
- polymer, growth on metal substrates, by electron bombardment 3=18266
- polymers, gas diffusion, linear free-energy relationship 3=2821
- production by cathode sputtering 3=14682
- radioactive materials, vacuum deposition 3=15125
- refractive index, small difference meas. 3=24007
- replica prodn. of selected areas for electron microscopy 3=25801
- rubber, natural, 1000 Å-thick spherulite morphology 3=20919
- semicond., elec. cond. theory 3=851
- semiconducting, parameters control during prodn. by evap. 3=25776
- semiconductor, forbidden bandwidth, thickness and temp. depend. 3=17843
- semiconductor layers, epitaxially grown, analysis 3=8813
- silica replica films, structure examin. 3=3375
- specific heat, thermal vibr. theory 3=12923
- sputtering, r.f. plasma method 3=6883
- steel layers, case-hardened, substructure 3=1247
- stress meas. after vac. depos., probe 3=16142
- superconducting; mag moment 3=6688
- superconducting, magnetic moments and critical fields 3=24142
- superconducting, vapour sources for vacuum deposition 3=9525
- superconductivity, shape resonances 3=19101
- superconductivity, switching time 3=5587
- thermal vibrations 3=4810
- thermoplastics, elec. charged, wrinkling deformation 3=23493
- thickness of coatings meas., β -ray back-scatt. gauge 3=23827
- thickness meas., activation method 3=23828
- thickness meas., silver-modified Newton's rings 3=9394
- thickness meas., using Tolansky's fringes
- thickness meas. by transmission electron micr. 3=13583
- thin surface deposit, detached from substrate 3=20930
- tunnelling through thin films with traps, calc. 3=825
- vacuum deposition, residual stress control 3=13566
- work function, films evap. from UC 3=4179
- X-ray diffraction obs. 3=20812
- $A^{II}B^{VI}$ — $A^{II}B^{VI}$ solid solutions, prep. and semicond. props. 3=2882
- Ag, defects prod. on evaporation 3=1374
- Ag deposited on water surface 3=25774
- Ag, electron beam energy loss 3=20152
- Ag, granular, electrical properties and flicker effect 3=15540
- Ag, Im $1/\epsilon$ absorpt. spectrum 3=10963
- Ag layer growth in electron microscope 3=18881
- Ag, low lying energy loss 3=10633
- Ag, for multiple-beam interferometry 3=21560
- Ag, optical props. 0.6–2.4 μ 3=11934
- Ag, optical properties rel. to heat treatment 3=13146
- Ag, neutron irradi. effects, for various conditions 3=22869

Films—contd

solid—contd

- Ag, photoelectric emission, by X-rays, 0.28–9 keV, effective depth 3=21864
- Ag, quenched-in vacancies, effect on lattice 3=22733
- Ag, single-crystal foils, prep. method 3=1367
- Ag, spattering inside electron microscope 3=451
- Ag, structure rel. to speed of formation 3=20923
- Ag, transverse electric field effects 3=15541
- Ag, 35–50 μ , tensile strength, 100–300°C 3=6783
- Ag–Au, on mica, double-positioning structure 3=1376
- Ag–Fe, structure 3=13563
- Ag₂Te, elec. props., structure 3=833
- Ag–Te, electron diffraction study 3=18383
- Ag₂Te, structure transformation 3=18384
- Al, cooled layers, elec. cond., and Hall const. 3=4906
- Al defect structures rel. to n-irrad. 3=17735
- Al, evap. from W heaters, W content meas. 3=1364
- Al, evaporated, elec. cond. and Hall const. 3=8494
- Al, oriented, growth on alkali halide substrates 3=18254
- Al oxide, negative resistance 3=20321
- Al oxide, anodic on Al, electron optical investigation 3=6918
- Al, resistance—strain characteristics 3=22902
- Al, 60 μ thick, quenched, dislocation loops with stacking fault 3=2804
- Al, superconductivity 3=14447
- Al, superconductivity and normal cond. rel. to adsorbed O 3=16872
- Al, transverse electric field effects 3=15541
- Al, vacuum u.v. reflectance 3=11883
- Al, X-ray reflection, 1.54 Å, 500–3000 Å thick 3=23093
- Al–Ag (25%) alloy, structure, by electron diffr. 3=6884
- Al–Ag (25%), γ^1 -phase, orientations 3=18110
- Al (50 wt%)–Cu, transformation, electron microscope study 3=443
- Al–Fe, evaporated, mag. anisotropy and Al source position 3=18084
- Al–In, superconducting, crit. temp. increase on exposure to water vapour 3=19107
- AlN, 1–10 μ , from chloride, in electrical discharge in N₂ 3=13565
- AlN, deposited on quartz plates 3=13213
- Al₂O₃, current flow, mechanism 3=22976
- Al₂O₃, dielectric constant 3=8555
- Al₂O₃, preparation 3=5147
- As, preparation, structure and electrical properties 3=17875
- As₂S₃, amorphous, 3 to 8 μ m, I–V characteristics 3=889
- As₂Se₃, amorphous, structure 3=13461
- As₂Te₃, amorphous, structure 3=13461
- Au, cond. electrons m.f.p., scatt. parameter 3=15546
- Au, conductivity and supercond critical temp. rel. to electrostatic charging 3=15545
- Au, damage by inert gas ions 3=10707
- Au deposited on water surface 3=25774
- Au, doped, clusters of point defects 3=25270
- Au, electrical conductivity, rel. to various support 3=15542
- Au, electrical resistivity 3=15543
- Au, evap. on C, growth and structure 3=1375
- Au, fission-fragment damage 3=22864
- Au, granular, electrical properties and flicker effect 3=15540
- Au, interstitial damage, rel. to Ar ion bombardment 3=17712
- Au, optical constants 3=13147
- Au, optical props. 0.6–2.4 μ 3=11934
- Au, optical properties rel. to heat treatment 3=13146
- Au, photoelectric emission, by X-rays, 0.28–9 keV, effective depth 3=21864
- Au on p-type GaP, photoelec. positive hole range 3=908
- Au, resistance 3=15537
- Au, resistance—strain characteristics 3=22902
- Au, single-crystal foils, prep. method 3=1367
- Au, sorption of H, CO, surface potential, diode meas. 3=13602

Films—contd

solid—contd

- Au, photoelec. emission rel. to thickness 3=425
 Au, transverse electric field effects 3=15541
 Au, X-ray and electron microscopy 3=6903
 Au—Pb films, evap., diffusion 3=20226
 Au—Si complex deposits, electrical conductivity 3=20331
 Au—Si, composition, structure 3=3354
 B, on thin C backings, prep. 3=11319
 B, prep. and props. as electron microscope substrate material 3=18411
 B, prepn. for neutron cross-section meas. 3=11321
 BaO, on W, work function, var. with temp. and deposition time 3=19296-7
 BaTiO₃, monocrystalline, prep. method 3=2954
 Be, photoelectric emission, by X-rays, 0.28-9 keV, effective depth 3=21864
 Be—BeO—Au tunnelling structure 3=13069
 BeO, current flow, mechanism 3=22976
 BeO, external photoeffect, and secondary electron emission 3=24337
 Bi, amorphous, electron diff. exam. 3=16123
 Bi, magnetoresistance, thermal evolution 3=8517
 Bi, thermal effects during condensation 3=19074
 Bi, transverse electric field effects 3=15541
 Bi, on Bi, cleavage faces, by thermal evaporation Ion, structure 3=16136
 BiOCl, electron diffraction intensities rel. to tilting angle, crystal size & wavelength 3=1372
 C, graphitization and deformation 3=13395
 C, pyro, crystal lattice structure, effect of heat treatment 3=20272
 C, pyro, electrical properties, effect of heat treatment 3=20272
 C replica films, structure examin. 3=3375
 CaF₂, absorpt. edge, temp. depend. 3=3002
 CaF₂, structure from optical consts., adsorption formation theory 3=13560
 CaO, optical absorption, elec. cond., thermoelec. power 3=20471
 CaS, microcrystal orientation 4=16021
 Cd, preparation and u.v. absorption 3=11318
 Cd, unbacked, 50 $\mu\text{g cm}^{-2}$, preparation 3=11320
 Cd, vacuum condensate, props. 3=16036
 CdO, elec. and optical props. 3=25359
 Cd(OH)₂, electrocrystallization 3=16170
 CdS, crystallinity and electronic props. 3=22941
 CdS, elec. cond., rel. to temp. 3=25363
 CdSe, contact potl., light-induced changes, wavelength depend. 3=23014
 CdSe, crystal structure, on (110), (100) rocksalt faces 3=18378
 CdTe, evap., props. rel. to deposition temp. 3=23508
 CdTe, monocrystalline, on mica and NaCl, structure 3=20944
 CdTe, photocond., effect of additives 3=20407
 CdTe, photoelectric e.m.f., "single crystal", on NaCl, KCl, KBr 3=17957
 CdTe, photovoltaic effect 3=2973
 CeO₂, dielectric constant 3=8555
 Co, absorption, light, oxidation and wavelength effects 3=17991
 Co, crystal struct. 3=1369
 Co, electrical conductivity and perp. Hall effect 3=17822
 Co, electrical and thermoelectric properties 3=15539
 Co, electron mirror micrographs, stray field meas. 3=13266
 Co, ferromagnetic domain wall movements, electron microscope obs. 3=23168
 Co, ferromagnetic spin pinning 3=15839
 Co films, 1000 Å, f.c.c., ferromagnetic domain obs. 3=20605
 Co, mag. domain structure in epitaxial films 3=15830
 Co, mag. props. and structure, atomic, for n polarization, var. with electrolysis conditions 3=23509
 Co, magnetic domains 3=18086
 Co, orientated overgrowth 3=18379
 Co, resistance—strain characteristics 3=22902
 Co, strip domain structure 3=20587
 CoFe₂O₄, Faraday rotation and mag. hysteresis 3=15655

Films — contd

solid — contd

- Co—Ni—P alloys, hard magnetic props. 3=15835
 Cr, Cr + Ni, vacuum evaporated, on C at 400°C, electron diff. exam. 3=16143
 Cr, deposition, evaporation rate rel. to background pressure 3=18382
 Cs, photoelectric properties rel. to temp. and thickness 3=15550
 CsI : Tl, 1 μm , electroluminescence 3=20541
 Cs—Sb, photoelectrons, ang. distrib. 3=19313
 Cu, absorption, light, oxidation and wavelength effects 3=17991
 Cs,Sb, photoelectric emission, effect of n irradiation 3=14632
 Cu, crystal foil, work-hardening 3=23344
 Cu, electrolytically-deposited, surface morphology 3=18234
 Cu, epitaxial growth on W field emitters 3=25681
 Cu, grain structure and distortion 3=2817
 Cu, granular, electrical properties and flicker effect 3=15540
 Cu, neutron irradi. effects, for various conditions 3=22869
 Cu, optical properties rel. to heat treatment 3=13146
 Cu, quenched-in vacancies, effect on lattice 3=22733
 Cu, reflection and transmission, light, 4-20 μm , anomaly 3=17996
 Cu, from rolled Cu, prep. and tensile testing 3=5073
 Cu, sorption of H, CO, surface potential, diode meas. 3=13602
 Cu, stresses 3=11145
 Cu, vacuum evap., structure, strength 3=1366
 Cu, 35-50 μ , tensile strength, 100-300°C 3=6783
 CuAu, nucleation and growth of order 3=8902
 CuI, crystal exciton absorpt. bands, 82° K 3=20473
 CuI, oxygen-controlled elec. conduct. 3=13071
 Cu—Ni oxide, morphology 3=18432
 Cu—Ni, submicroporosity, effect of annealing and loading 3=23510
 CuO, Cu₂O, on Cu, in O₂, growth mechanism 3=23516
 Cu₂O, absorpt., light and exciton formation 3=13170
 Cu₂O, deposition by sputtering of Cu in A and O 3=16138
 Cu₂O, sputtered, growth structure, by electron diff. 3=16139
 Dy, resistance, spin-ordering effects 3=15547
 Fe, absorption, light, oxidation and wavelength effects 3=17991
 Fe, coercive field strength 3=15810
 Fe, conductivity, electrical, up to 300°C, and activation energy 3=15538
 Fe, easy axis magnetization reversal 3=11087
 Fe, ferromag. res., 9, 18, 24 Gc/s 3=20630
 Fe, ferromagnetic resonance, single-crystal films 3=15919
 Fe foils, point defects, rel. to n-irrad. 3=17702
 Fe, longitudinal Kerr magneto-optical effect 3=13157
 Fe, mag. domain structure in epitaxial films 3=15830
 Fe, mag. props. 3=20600
 Fe, mag. props. rel. to evaporation geometry 3=1070
 Fe, magnetic anisotropy, effect of crucible material 3=18082
 Fe, magnetization distrib. meas. 3=18091
 Fe, magnetization jumps, magnitude distrib. 3=20599
 Fe oxide on Fe, layer structure 3=20928
 Fe Procopin and magnetization effects rel. to thickness 3=3109
 Fe, spin-wave resonance 3=3155
 Fe, superconductivity, no evidence 3=19109
 Fe, 1500-2000 Å, large Barkhausen jumps 3=11080
 Fe—Al, evaporated, mag. anisotropy and Al source position 3=18084
 Fe—0.03% C, precipitation, rel. to Nb addition 3=20899
 Fe—Cr—Ni alloy, phase transformations 3=23474
 Fe on MgO surface, domain wall struct. 3=1080
 Fe—Mn—C foils, martensite nucleation 3=23475
 Fe—(17.2 at%) Ni alloy, repeated twin observation 3=1315
 Fe—Ni, domain structure rel. to temp. 3=11081
 Fe—Ni, electroplated, mag. props. 3=13259
 Fe—Ni ferromagnetic anisotropy 3=11082
 Fe—Ni foils, martensite nucleation 3=23475
 Fe—Ni, magnetostriction 3=11084

Films — contd

solid — contd

- Fe—Ni, martensitic transform. 3=20884
 Fe—Ni—Mo alloy, mag. props. 3=20600
 Fe—Ni—Mo, domain structure rel. to temp. 3=11081
 Fe—Ni—Mo, 1500-2000A, large Barkhausen jumps 3=11080
 Fe(17%)—Ni(79%)—Mo(4%), ferromagnetic anisotropy 3=11082
 γ -Fe₂O₃, remanent magnetization 3=13256
 Fe₃O₄, magnetization meas., by electron diffr. 3=23181
 Fe—(3.1-3.6%)Si, deformation twins 3=17778
 Ga, preparation, structure and electrical properties 3=17875
 GaAs, preparation 3=17875
 GaAs wafers, thermal oxidation 3=2943
 GaN, 1-10 μ , from chloride, in electrical discharge in N₂ 3=13565
 GaSb, undoped, sputtered on glass, structure and elec. props. 3=3357
 Ga₂Se₃, amorphous structure, electron diffr. study 3=20915
 Ga₂Te₃, amorphous structure, electron diffr. study 3=20915
 Gd, magnetoresistance 3=15552
 Gd, resistance, spin-ordering effects 3=15547
 Ge, absorption and reflectivity, u.v. 3=2995
 Ge, catalysis and adsorption of H 3=3397
 Ge, elec. breakdown, low-temp., rel. to thickness 3=20311
 Ge, electronic interaction with CO 3=25346
 Ge, epitaxial formation conditions 3=18284
 Ge, epitaxial layers, growth 3=18283
 Ge, epitaxial on single crystals, structure 3=3280
 Ge, epitaxial, surface roughness 3=25771
 Ge, epitaxially deposited on CaF₂, physical and elec. props. 3=23416
 Ge, evap.-condensation method for transistors 3=23511
 Ge, evap., electronic interact. with O₂ 3=13062
 Ge, growth 3=23398
 Ge, on metal, prep. and props. 3=11317
 Ge, photoelectric emission, by X-rays, 0.28-9 keV, effective depth 3=21864
 Ge, polycrystalline, electrical properties and flicker effect 3=15540
 Ge, polycrystalline, structure and elec. props. 3=8507
 Ge, resistance, electrical, acceptor levels, work function, ultra-high vacuum 3=20309
 Ge, structure, elec. and optical props., rel. to evap. parameters 3=20926
 Ge, surface patterns, triangular 3=20925
 Ge, vacuum deposition on Ge 3=23399
 Ge, 12-60 m μ , reflectivity and transmission, wavelengths 0.4-0.7 μ 3=10953
 Ge—ZnS, i.r. transmission curves 3=10952
 H₂, D₂, free radicals, prod. by p and d bombardment, 100-1000 V, e.p.r. 3=10550
 HBr, i.r. absorption 3=25460
 HCl, i.r. absorption 3=25460
 Hg, freshly deposited, superconducting props 3=327
 In, conductivity and supercond critical temp. rel. to electrostatic charging 3=15545
 In, electrical conductivity, rel. to size 3=15548
 In, electrical and thermal conductivities 3=15448
 In on glass substrate, optical props. 400-1000 m μ 3=25435
 In, structure in density of states 3=24143
 In, superconductivity and normal cond. rel. to adsorbed O 3=16872
 In superconductivity, rel. to residual gases 3=16878
 In, thermal effects during condensation 3=19074
 InN, 1-10 μ , from chloride, in electrical discharge in N₂ 3=13565
 InSb, undoped, sputtered on glass, structure and elec. props. 3=3357
 In₂Se₃, amorphous structure, electron diffr. study 3=20915
 In₂Te₃, amorphous structure, electron diffr. study 3=20915
 K, optical consts, 20° to 60°C 3=25437
 KCl, photoelectric emission, by X-rays, 0.28-9 keV, effective depth 3=21864
 KCl, point defect aggregation 3=22731
 K₂Sb, photoelectric emission, effect of n irradiation 3=14632
 LiF with, adsorbed water, dielectric admittance 3=10880

Films — contd

solid — contd

- LiF, deposition, stress and surface temp. 3=16142
 LiF, evap. on C, growth and structure 3=1375
 LiF(Cl, Br), energy losses of 30 kV electron beam 3=15478
 Mb, vacuum deposition, using spring-loaded conductors 3=9524
 Mg, diffusion of In backing and film superconductivity 3=22805
 Mg foils, dislocations, dipole, loop, prismatic 3=17751
 Mg—Au alloy, vacuum deposition, orientation 3=20924
 MgO, optical props. meas. 3=924
 MgO surface, for reflectance standard 0.3-2.6 μ 3=1786
 Mo, adsorption of CO and N, 10⁻⁶—10⁻⁸ mm, -195- +22°C 3=16146
 Na, electrical conductivity, rel. to temp. and thickness 3=15550
 Na soaps, electron diffraction patterns 3=16145
 NaCl, evaporated films, sintering, mechanism 3=25777
 NaCl, orientation var. with vapour stream angle by electron diffr. 3=13561
 NaCl, rapidly condensed, crystal orient. 3=8799
 NaF, structure, electron diffr. study 3=25680
 (Na₂K)Sb, (Na₂K)CsSb, photoelectric emission, effect of n irradiation 3=14632
 Nb, anodic film, structure 3=23507
 Nb—Sn, diffusion, supercond., prep. and props. 3=19118
 Nb₂Sn, superconducting, critical current, temp. and mag. field var. 3=19120
 Nb₂Sn, superconductivity, rel. to stress effects 3=1903
 Ni, absorption, light, oxidation and wavelength effects 3=17991
 Ni, aggregate structure, etching 3=1373
 Ni, anisotropic shape effects 3=15815
 Ni, chem. precipitated, structure and mag. props. 3=5013
 Ni, conductivity, electrical up to 300°C, and activation energy 3=15538
 Ni, crystal structr. 3=1369
 Ni, elec. resist. and Hall e.m.f., 2° to 300°K 3=832
 Ni, elec. resist., effect of O₂ and BaO adsorption 3=30371
 Ni, electrical props. at 300°K 3=4905
 Ni electrical resistivity, rel. to thickness 3=17823
 Ni, electrolytically-deposited, surface morphology 3=18234
 Ni, evaporated, single-crystal, internal stresses, effect on mag. props. 3=13344
 Ni, evaporation decoration of cleaved NaCl 3=20931
 Ni, ferromag. Curie point 3=1077
 Ni, ferromag. resonance 3=23205
 Ni, longitudinal Kerr magneto-optical effect 3=13157
 Ni, mag. analysis by electron diffraction 3=5014
 Ni, mag. domain structure in epitaxial films 3=15830
 Ni, mag. props rel. to cathodic H 3=1075
 Ni, mag. props. rel. to pressure during evaporation 3=1072
 Ni, magnetic properties rel. to thickness and structure 3=15823
 Ni, magnetization measurements 3=17020
 Ni magnetization rel. to temperature 3=15821
 Ni, magnetization, saturation, effect of electrolytic H 3=20606
 Ni, magnetoresistance 3=17825
 Ni, neutron irradi. effects, for various conditions 3=22869
 Ni, resistance, electrical, and work function, effect of adsorption of Ba 3=13040
 Ni, resistance—strain characteristics 3=22902
 Ni, single and polycrystalline, domain structure obs. 3=18089
 Ni, structure, evaporated in inert gas, rel. to catalysis 3=20929
 Ni, ultrathin, saturation magnetization and anisotropy 3=15822
 Ni—Co—P, ferromag. shape anisotropy 3=20602
 Ni + Cr, vacuum evaporated, on C at 400°C, electron diffr. exam. 3=16143
 Ni—Fe, Bloch lines 3=15809
 Ni—Fe, electrodeposited, mag. props. 3=25537
 Ni—Fe, evaporated, composition 3=18377
 Ni—Fe, ferromag. anisotropy, positive and negative 3=1067
 (80%)Ni—(20%)Fe, ferromagnetic, superimposed, domain wall interaction 3=18085

Films — cont'd

solid — cont'd

- Ni-Fe films, domain behaviour rel. to anisotropy 3=15818
 Ni-Fe, internal stresses rel. to domain structure 3=20595
 Ni-Fe, mag. anisotropy 3=1068
 Ni(40-100%)-Fe, mag. anisotropy 3=1069
 Ni-Fe, mag. anisotropy, rel. to magnetostriction 3=15843
 Ni-Fe, magnetic domain walls 3=15829
 Ni(80%)-Fe(20%), magnetization reversal 3=1082
 Ni-Fe, magnetization reversal, static 3=13236
 Ni-Fe, magnetoresistance meas. 3=14470
 Ni-Fe, mag. props. rel. to anisotropy dispersion 3=18083
 Ni-Fe, negative magnetic anisotropy 3=15807
 Ni(80%)-Fe(20%), oxide layer surf. spin pinning 3=1168
 Ni-Fe, spiral and concentric mag. domain walls 3=15846
 Ni-Fe switching by non-coherent rotation 3=1081
 Ni-Fe (80/20%), u.s. switching of magnetization vector 3=15826
 Ni(40-100%)-Fe, uniaxial anisotropy, torque meas. 3=15814
 Ni-Fe, wall movement, field strength 3=18090
 Ni80Fe17Co3 alloy, varn. of dispersion angle with thickness 3=8675
 Ni-Fe-Co alloys, mag. wall-wall interaction between films 3=15833
 Ni₂Fe₂O₄, Faraday rotation and mag. hysteresis 3=15655
 NiZnCo ferrites, and mag. props. 3=16140
 P-Ni chemical deposits, elec. cond. 3=10725
 Pb, conductance during vacuum deposition 3=25327
 Pb, superconductivity and normal cond. rel. to adsorbed O 3=16872
 Pb superconductivity, rel. to residual gases 3=16878
 Pb, supercond., vapour sources for vacuum deposition 3=9525
 PbO, high refr. index, production 3=8927
 PbO₂, sputtered, semicond. props. 3=2919
 PbS, epitaxial, magneto-optical absorpt. lines 3=17984
 PbS, evap., dislocation types 3=17754
 PbS, layer formation on glass and mica 3=13564
 PbS photovoltaic layers, structure, e.m.f. 3=3356
 PbS(n)-PbO(p), photo and tunnel conduction, impurity, in Resistor charge-storage tubes, 3=25419
 PbSe evaporated layers 3=15633
 Pd, resistance-strain characteristics 3=22902
 Pt, elec. resistance, temp. var., rel. to thickness 3=15544
 Pt, electrical conductivity, rel. to adsorption of gas 3=1554
 Pt foils, loops and dots, rel. to irradiation 3=17701
 Pt, resistance-strain characteristics 3=22902
 Pt-C, phase-structr. by electron diffraction 3=1370
 Pu, prepn. for neutron cross-section meas. 3=11321
 Re on Si, polarized, thermal light emission 3=17880
 Sb, internal stress, elec. cond. 3=20701
 Sb, resistance-strain characteristics 3=22902
 Sb, transverse electric field effects 3=15541
 Sb, on Sb cleavage faces, by thermal evaporation Ion, structure 3=16136
 Sb₂Se₃, amorphous structure, electron diffr. study 3=20915
 Sb₂Te₃, amorphous structure, electron diffr. study 3=20915
 Se, absorption and reflectivity, u.v. 3=2995
 Se, optical constants 3=25438
 Si, absorption and reflectivity, u.v. 3=2995
 Si, epitaxial, growth and defects 3=5091
 Si, epitaxial, stacking faults structure, origin 3=10680
 Si, epitaxial, vacuum evap. 3=13424
 Si, evap., prepn. 3=8926
 Si oxide, thermally oxidized, absorpt. 9μ, decrease on γ-irradiation 3=13189
 Si, in vacuo, evaporation, fabrication 3=20927
 Si-Fe, ferromag. domain structure 3=11076
 Si₃N₄, dielectric constant 3=8555
 SiO, dielectric constant 3=8555
 SiO, evap., stress in, effect of exposure to air 3=1365
 SiO, optical props. rel. to evap. rate 3=20486
 SiO, stress anisotropy rel. to prep. 3=11144
 SiO, sublimated films, residual stresses 3=11146
 SiO₂, dielectric constant 3=8555
 SiO₂ films on Si, refr. index and thickness 3=13149
 SiO₂, insulation 3=21388

Films — cont'd

solid — cont'd

- SiO₂, on Si, in O₂, at 1250°C, growth mechanism 3=23516
 SiO₂, passivation of p-n junction particle detectors 3=7749
 Sn coating on steel, bonding phase structure 3=5146
 Sn, conductance during vacuum deposition 3=25327
 Sn, conductivity and supercond critical temp. rel. to electrostatic charging 3=15545
 Sn crystallites on SiO films, size distrib. 3=18380
 Sn, destruction of supercond., by current pulses 3=3966
 Sn, dislocations 3=17736
 Sn normal-superconducting phase boundary, thermal propagation 3=16877
 Sn, supercond., vapour sources for vacuum deposition 3=9525
 Sn, superconducting, crit. current density rel. to temp. 3=3965
 Sn, superconducting; mag. moment 3=6687
 Sn, superconducting mag. transitions 3=19124
 Sn, superconducting phase transitions, hysteresis 3=9687
 Sn, superconductivity and normal cond. rel. to adsorbed O 3=16872
 Sn superconductivity, rel. to residual gases 3=16878
 Sn, thin, on crystal substrates, condensed, orientation 3=13562
 Sn on Cr-plated steel, bonding phase structure 3=5146
 SnO₂, n-type, refl. coeff., effect of free carriers 3=6642
 SrTiO₃, microscopic examination, low-temp. 3=17940
 Ta, anodic film, structure 3=23507
 Ta, vacuum deposition, using spring-loaded conductors 3=9524
 Ta₂O₅, in Ta-Ta₂O₅-Au diodes, electron transport mechanisms 3=6611
 Tb, resistance, spin-ordering effects 3=15547
 Te, absorption and reflectivity, u.v. 3=2995
 Te, resistance-strain characteristics 3=22902
 Ti layers electrodeposited on Cu 3=16176
 Ti oxide anodic films, graded p-n junctions 3=4929
 Ti oxide diodes 3=17915
 Ti, sputtered, elec. props and structure 3=25328
 TiO₂, p-n junctions, piezoeffects 3=13127
 Tl, superconductivity and normal cond. rel. to adsorbed O 3=16872
 Tl halides, evaporated, polymorphy 3=11261
 TlBiSe₃, hexagonal structure 3=20850
 U, evaporation in vacuum 3=8925
 U, prepn. for neutron cross-section meas. 3=11321
 UF₆, on UO₂, formation kinetics, optical meas. 3=24043
 U-Mo two-phase alloys, electron micr. study 3=5154
 UO₂, fission fragment tracks 3=822
 V, superconductivity 3=19109
 V-Si, V-Ga, diffusion, supercond., transition temp. 3=16880
 V-Si, prep. and supercond. props. 3=3967
 V, Si, 6.1 X 10⁻⁸ cms, magnetization 3=8677
 W, prep., props. 3=11316
 W, resistance, electrical, and work function, effect of adsorption of Cs 3=13040
 W, vacuum deposition, using spring-loaded conductors 3=9524
 W₂N₆, rhombohedral, structure 3=13460
 Yb₂O₃, dielectric constant 3=8555
 Zn coating on Cu, bonding phase structure 3=5146
 Zn coating on steel, bonding phase structure 3=5146
 Zn, vacuum condensate, props. 3=16036
 ZnO, luminescent, sublimation 3=16144
 ZnS, dielectric constant 3=8555
 ZnS, luminescent, sublimation 3=16144
 ZnS, structure from optical const., adsorption formation theory 3=13560
 Zr, anodic film, structure 3=23507

Filters

- acoustical bandpass, for sound analysis 3=227
 photometric, for spectral correction 3=3862
 totally reflecting resonance filter 3=17050

Filters, electrical

No entries this year

Filters, optical

- See also Absorption, light; Optical films.
 birefringent, visual photometer accessory 3=9140

Filters, optical — contd

- calc., interference, layer, by successive synthesis 3=21558
- diffraction gratings, broad-band, low-pass, i.r. 3=19021
- far u.v., interference transmission filters 3=1831
- Hoshino-Yoshida, u.v., stability and improvement 3=1823
- image-forming, using resonance scatt. 3=16780
- infrared, 0.8-1.1 μ 3=9604
- i.r. gratings, transmission, echellette, for spectroscopy 3=16775
- i.r., interference, analysis 3=19011
- i.r. narrow band pass filters 3=1824
- linear, non-negative signals transmission 3=3892
- multi-layer coating, known reflectivity, calculation 3=1827
- reststrahlen, infrared 3=16749
- rotating, three-step, variable 3=16756
- Schott, three, lower cutoff, temp. depend. 3=9606
- solar radiation study, short-wave 3=9151
- storage and retrieval of information in two-and three-dimensions 3=11910-11
- star obs., bandwidth, effects on detected energy 3=18585
- u.v., simultaneous selection of several freq. bands 3=3885
- u.v. solar radiation study 3=1502

Fission

See Nuclear fission.

Flames

See also Spectra, flames.

- acceleration in transition to detonation 3=3392
- acetone-air, acetylene-air, temp. meas., by alkali metal spectral lines 3=16829
- acetylene decomposition, reaction mechanism from "global" flame kinetics, deduction 3=25827
- acetylene; added Na and Sr concentration and temperature calc. 3=3393
- acetylene, anomalous excitation in reaction zone 3=23543
- acetylene, dissociation and ionization processes, in outer cone 3=23542
- active N, violet spectrum of CN 3=8253
- arc plasma jet, temp. meas., in terms of Fe spectrum 3=16921
- benzene, thermal ionization, 1100°-1700°K 3=5623
- Bunsen-type, diffusion-determined space-charge layers 3=14399
- caloelectric effect 3=19184
- in channels, flow fields, source sheet approx. 3=21594
- chemi-ionization 3=19178
- conference, 9th international, Ithaca, N.Y. (1962) 3=21592
- in cryogenic solids containing free radicals, effect of crystalline-phase transformation rates 3=5161
- flame-high-freq-torch combination, temp. meas. 3=3913
- Heffner, temp., by pyrometer, two-frequency 3=9644
- high temp. prod., cyanogen-ozone, carbon subnitride-oxygen 3=21602
- hydrocarbon-air mixture, ignition limits 3=25826
- i.r. radiation by extrapol. from lab. meas. 3=11992
- ion profiles in low-pressure flames 3=7435
- ionization, nonequilibrium 3=24209
- large, rel. to ionosphere disturbs. 3=6976
- laminar, one-dimensional, stability 3=279
- metal halides, with active N, metal spectra var. 3=22605
- methane-air, methane-oxygen, temp. meas., by alkali metal spectral lines 3=16829
- methane-H₂-air, probe characteristics 3=4154
- metal powder-oxygen, emission spectra 3=10504
- oxy-hydrogen flames, heat transfer 3=21593
- photometers, pneumatic annular atomizers 3=21549
- photometric absorpt. meas., signal-to-noise ratio 3=21548
- plasma torch, heat transfer 3=21593
- pyrometer, two-frequency 3=9644
- radiance-coeff. profile, exptl. det. 3=24004
- radiation characteristics, containing MgO particles 3=924
- spectrochemical analysis by absorption, atomic, use of Beer-Lambert law to improve cells 3=23556
- spherical, form, air-propane (4.16%) 3=5550
- stability, laminar 3=11980
- temperature meas., from alkali indicator partial pressure 3=19051
- temperature meas., by spectral lines of alkaline metals 3=16829

Flames — contd

- turbulent, gasoline, acoustic noise power and spectral distrib. 3=11872
- turbulent, open, noise prodn. 3=14289
- H₂-O₂, emission, absorpt. and temp. meas. 3=5162
- in Ar, Mo cathode, plasma jet, temp. meas., in terms of Fe spectrum 3=16921

Flares, solar

See Sun, flares.

Flocculation

See Sedimentation.

Flow

See also Diffusion; Jets; Plastic flow; Turbulence; Viscosity.

- acoustical equations, integration 3=23917
- aerosols, first-order slip-flow continuum analysis 3=6935
- attapulgite suspension in water 3=11362
- boundary layer, around arbitrary shape 3=112
- boundary layer, static hole error rel. to velocity distrib. 3=5406
- boundary layers, three dimensional 3=9415
- channel, Orr-Sommerfeld eqn., numerical soln. 3=102
- in channel, velocity distrib. in wall region 3=11757
- compressible fluid, kinetic energy spectrum 3=14106
- convective, past vertical plate with suction 3=3912
- Couette, in stratified fluid, perturb. 3=9412
- Couette, inviscid modes of instability 3=9413
- Couette, Landau law exptl. confirmation 3=23835
- deterministic nonperiodic, differential eqns. 3=14108
- diffusion, turbulent wall boundary layer, resistance law 3=14100
- dimensional analysis, use of governing eqns. 3=16578
- extremal point collocation method 3=5407
- fine particles through slit 3=100
- flames in channels, source sheet approx. 3=21594
- fluid, past plane wall containing mag. dipole 3=12302
- fluid, shear, source functions for diffusion 3=3797
- fluids, compressible, theory of characteristics 3=98
- fluids, generalized equation 3=21296
- fluids, through packed and fluidized beds 3=9420
- fluids through packed beds 3=9419
- free-convection layer along vertical flat plate 3=277
- heat and mass transfer in smooth tubes 3=7180
- heat transfer bibliography 3=7364
- hydromagnetic, between two non-parallel porous walls 3=7689
- hydromagnetic laminar flow in annulus with porous walls 3=2101
- ideal fluid, with pressure discontinuity along boundaries 3=16582
- laminar, in annulus, heat transfer theory 3=274
- laminar boundary layer with separation surface, Kochin-Loitsyanskii method applic. 3=11760
- laminar boundary layers, mass-transfer rates 3=18787
- laminar, dispersal theory 3=23847-8
- laminar, forced, with natural convection in vertical round tubes 3=103
- laminar free, elec. cond. fluid in mag. fld. 3=2114
- laminar, in inlet region of straight channel 3=106
- laminar, mass, momentum and energy transfer 3=7176
- laminar natural convection, porous walls 3=99
- laminar, of stratified fluid, stability 3=21294
- local velocity profile in boundary layer near non-uniformly heated plate 3=11755
- macromolecules, light scatt., depolarization 3=14165
- macromolecules, light scatt., interference factor 3=14164
- macromolecules, light scatt., two-particle correl. 3=14163
- magnetohydrodynamic, at low cond. 3=2103
- magnetohydrodynamic, due to rotating disk 3=479
- magnetohydrodynamic, past a rotating magnetized sphere 3=14570
- magnetohydrodynamic, past thin wave-shaped plate 3=14749
- magnetohydrodynamic, round flat vanes, normal and parallel to field 3=21962

Flow — contd

- magnetohydrodynamic, weakly dissipative fluid, finite conductivity, shock conditions 3=18893
- magnetohydrodynamics, temp. instability 3=9918
- moving layers, with dispersed solid material, heat exchange eqns. 3=11967
- Navier-Stokes eqn., linearized, complete soln. 3=23836
- Navier-Stokes equations, initial value problem 3=18776
- nonlinear viscous flow, axisymm. solns. 3=5408
- non-Newtonian, boundary layer 3=23832
- non-Newtonian, calc. from expts. 3=3788
- non-Newtonian fluid, between oscillating plates 3=9425
- non-Newtonian fluid, between rotating cylinders, with suction and injection 3=16589
- non-Newtonian fluid in porous channels 3=7182
- non-Newtonian fluid, secondary flow, between 2 rotating concentric spheres 3=16590
- non-Newtonian fluids, rel. to second law of thermodynamics 3=11769
- pipes, turbulent, heat and mass transfer 3=5411
- plane, undefined, uniform, velocity distrib. geometrical notes 3=7177
- plasma, almost one-dim., magnetohydrodyn. 3=7514
- plasma, quasi-one-dim., magnetohydrodyn. 3=21791
- Poiseuille, in tube, theory 3=23834
- Poiseuille, transition, simple model 3=7179
- Poiseuille's law in variable system, application conditions 3=7178
- in porous material vertical column, unsteady drainage 3=7191
- porous materials, Davey's law, correct form 3=14127-8
- porous media, viscous flow, three-point correl. 3=1670
- porous medium, anisotropic, permeability 3=7193
- porous wall, sound field effect 3=23833
- power-law fluids, past accelerated plane wall 3=11756
- power-law fluid, with suction and injection 3=14110
- pseudoplastic region, theory of flow curves 3=18198
- Rayleigh number, critical, variable viscosity effect 3=21297
- rotating cylinders, inviscid, non-rot.-symm. disturbances 3=1714
- sound-generating, vortex whistle 3=18916
- Spalding function, extensive calc. 3=11970
- spiral, stability criterion 3=9416
- Stokes flow of sphere 3=9424
- Stokes paradox 3=18777
- stratified fluid, by method of characteristics 3=9411
- stream-lines, soln. of eqn. 3=11661
- suspension, momentum, mechanical energy balance eqns. 3=101
- superposability and self-superposability 3=14098
- supersonic, past bodies of revolution, singularities 3=18778
- supersonic shear flow, boundary layer 3=21298
- 3-dimensional, magnetohydrodynamic 3=14750
- turbulence in porous-wall pipe 3=3784
- turbulent incompressible, intrinsic eqns. 3=115
- two-dimensional pot. flow fields, relation to stream line curvature 3=16580
- viscoelastic fluid, axially-symmetric and 2-dimensional stagnation point flow 3=11770
- viscoelastic, thro' tube, dimensionless groups 3=11771
- viscoelastic, in tube, axial stress at wall 3=11772
- viscous fluid in elastic tube 3=5404
- viscous fluid, surfaces, in general relativity 3=14095
- viscous, Frenkel diffusion theory 3=23329
- viscous, thermodynamic theory 3=1658
- visualization, colour schlieren photography 3=271
- vortex street development, numerical soln. 3=18782
- wedge, heat and mass transfer at surface 3=5409
- wedge, with small mass transfer rates 3=11752

gases

- See also Acoustic streaming; Aerodynamics; Anemometers; Supersonic flow.
- adsorbable gases and vapours in microporous medium 3=3823-4
- adsorbed, two-phase flow of vapours 3=25779
- Aeolian tones generation, fluctuating forces on cylinder 3=1770
- aerosols, thermal flow 3=7228

Flow — contd

gases — contd

- air, around streamlined plate, heat transfer 3=19033
- air, over bodies, electrostatic charging 3=21688
- air, through smooth approach nozzle 3=7227
- air, turbulent, longitudinal space-time correlation 3=18839
- along pipes, isothermal 3=18838
- anisotropic, rectilinear flows, single eqn. 3=23916
- arc reignition, influence 3=4080
- around arcs in nozzles, under forced convection theory 3=7485
- blunt-body flow, rel. to shock waves 3=5457
- boundary-layer, forced, film condensation 3=300
- capillaries, wide, pressure-temperature reln. 3=152
- capillaries, wide, pressure-temperature reln. 3=5453
- compressible, heat transfer, boundary layer calc. 3=18842
- from compression in a reservoir, press. temp. relations 3=7224
- conical supersonic flow, shock-wave analysis 3=159
- cylinder drag in transition from continuum to free-mol. flow 3=9486
- differential eqns. as time function of pressure 3=21452
- discontinuous gasdynamic eqn., soln. 3=23918
- dissociated, about catalytic probe, slow flow 3=9488
- effusion through conical orifices, theory 3=18851
- equilibrium, approaching 3=23921
- flames, laminar, stability 3=11980
- forced, between surface and rotating disk; viscous couple exerted 3=9485
- free-convection velocity profiles, using particles. 3=153
- free-molecular, momentum transfer to metal surfaces 3=5456
- free-molecular, through clearance with one moving wall 3=1716
- with friction, skin, and heat transfer, uniform channel 3=14194
- hypersonic, dissociated, local atom concns. 3=9487
- jets, air, supersonic, into water 3=7226
- Knudsen number, relevant system dimension 3=21422
- leading edge of shock-induced boundary layer 3=1753
- magnetogasdynamic, between coaxial cylinders with potential between 3=17044
- magnetogasdynamic flow, one-dimensional, with wall friction 3=19431
- magnetogasdynamical, substitutional principle 3=14748
- magnetohydrodynamic, Faraday and Hall-type channels one-dimensional analysis 3=14752
- magnetohydrodynamic generator, Hall effect, one-dimensional analysis 3=14760
- magnetohydrodynamic Hall effect generator, one dimensional theory 3=17045
- magnetohydrodynamic, plane and axisymmetric stationary gas flows 3=19434
- magnetohydrodynamic, round thin profiles 3=19426
- magnetohydrodynamic, with radiation 3=19425
- magnetohydrodynamic, with shock waves 3=12305
- methane, turbulent wakes 3=164
- molecular, beam formation, directivity 3=2679
- molecular flow in isothermal enclosure 3=14201
- molecular, passage through ducts of arbitrary form 3=18852
- molecular, through tubes, diffuse wall reflection 3=16648
- nonequilibrium, vortex sheet instability 3=1715
- oil vapours in piping, low conductance 3=16647
- polyatomic gas thro. normal shock wave 3=21424
- porous materials, flow resistance 3=23983
- through porous materials, air, rarified, from free mol. to viscous flow 3=9483
- radial flow in crossed fields, conducting gas 3=12306
- rarefied gas dynamics, dispersion relations 3=7237
- rarefied, through tubes with diaphragm ends 3=9502
- over reactive surface, effect on equilib. 3=21423
- shear, gas mols. interact. with central arbitrary force 3=9498
- shock-tube boundary flow, tracer study 3=7285
- behind shock wave, dissociation and recombination 3=11857
- skin friction decrease by gas injection 3=23919

Flow—contd**gases—contd**

- slip coeff. evaluation 3=18841
- slip-flow, appl. of Boltzmann eqn. 3=3826
- steady state, atomic concentration space-time variation 3=25068-9
- stopcock, variable two-way 3=16587
- stream gas dynamics 3=18837
- supersonic, dissociating diatomic gas 3=18854
- supersonic, rarified, pitot tube performance 3=14197
- temperature and Mach number meas. device, 0°-6000°C 3=1718
- in tube with heat source 3=18933
- 2-dimensional, in aligned mag. field 3=21963
- unstable, internal relaxation or zero energy reactions, shock wave 3=23921
- vertical flow, concentration and vel. formulae 3=23920
- viscous flow with heat transfer 3=24122
- viscous, momentum transfer 3=5463
- visualization using low-density plasma streams. 3=157
- water vapour, in porous materials 3=11819
- through wire meshes, resistance, calc. 3=7225
- He, thermal transpiration, 10⁻⁸-20 torr 3=18844
- He-tracing of flow patterns 3=14198
- Hg vapour, effusion from Knudsen cells 3=16642
- O₂, effect in microwave (3 cm) breakdown 3=9516
- Sn through orifices, unrecognized characteristics 3=11814
- Zn vapour through Pyrex tubing, anomalous 3=14195

liquids

- See also Acoustic streaming; Double refraction, flow; Hydrodynamics; Superfluidity.
- anomalies in very thin capillaries 3=7195
- boundary layer, turbulent, heat transfer 3=5410
- convection forced, in a bend 3=9426
- divergent limiting turbulent layer, static pressure distrib. 3=117
- elastico-viscous liquid, curved channel, stability 3=23846
- elastico-viscous, short memory 3=11768
- groundwater flow with free surface, models 3=7189
- imaging of streamlines, methods 3=9427
- inclined plane, layer, stability 3=11765
- incompressible liquid, in given space 3=5419
- laminar boundary-layer equations at low magnetic Reynolds number 3=4259
- laminar boundary layer under wave 3=1667
- local vels. meas., hot-wire anemometer 3=14090
- macromolecular solns., dimensions of coil in laminar flow 3=21348
- macromolecular solns., orientation in shear flow and elec. field 3=16617
- magnetohydrodynamic, past semi-infinite plate 3=2105
- magnetohydrodynamic, two-dimensional 3=2102
- metals, in annulus, unilateral heat transfer 3=7366
- nematic and cholesteric organic cpds. 3=9441-2
- non-Newtonian, three-dim. boundary layer 3=23842
- ocean, β -plane, flow patterns 3=18204
- polymers, viscous 3=21351
- polymer melts, temp. probe 3=19052
- in porous media, non-Darcy flow 3=7192
- through powders, longitudinal 3=11737
- rotation bet. long coaxial cylinders 3=110
- slicks on Lake Huron 3=7187
- solutions of large molecules, capillary and porous flow, solute velocity increase 3=113
- solutions, capillary, exptl. re-evaluation 3=16597
- Stokes, laminar suspension orientation 3=9429
- stopcock, variable two-way 3=16587
- supersonic shear flow, boundary layer 3=21298
- suspensions of large liq. bubbles, through tubes 3=11777
- in tubes, momentum perturbation 3=5420
- in tubes, roughness effect on transition process 3=14119
- turbulent, dissipation fluctuations 3=3789
- viscoelastic, helical, single relaxation time 3=18789
- viscous incompressible, plane parallel, energy eqn. exact solutions 3=11767
- visualization, by Al pigment suspension 3=14118
- wakes, laminar, 2-dimens., stability at low Reynolds no. 3=11764

Flow—contd**liquids—contd**

- water, distilled, viscosity meas. 3=108
- water, in canals, effect of viscosity and capillarity 3=9431
- water, in plastic tubes, noise, acoustic 3=5505
- water, in porous materials 3=11819
- water, in porous media, electrokinetic phenomena 3=16596
- water rig, transparent models for flow study 3=7190
- water, viscous, rel. to dipole orientation 3=21399
- CCl₄, anisotropy of flow 3=21316
- He II, rotating, uniformly, mutual friction, axial component 3=19087
- He II, under large temp. and press. grads. 3=7398

Flowmeters

- See also Anemometers.
- e.m., for vapour vol. meas., two-phase metal flow 3=14125
- gas meas., total count method using Kr⁸⁵. 3=155
- gases, "Teleperm" calculator for process variables 3=5455
- for metal dewar evaporation rate meas. 3=19079
- for orbital velos., in underwater wave field 3=14126
- plasma, absorbing 3=21802
- radioactive tracer method 3=1669
- smooth approach nozzle, discharge coeff. rel. to Reynolds number 3=7227
- thermal pipe flowmeters, analytical calc. 3=154
- thermistor, for liquids and gases 3=9408

Fluctuations

See also Brownian movement; Random processes.

- digital analysis by TIMTAPE and DEUCE 3=14
- discharge tube noise, suppression 3=12091
- ferromagnetic single-domain particle 3=15762
- light intensity, partly polarized 3=23994
- in nuclear reactors, statistical estimation 3=693
- magnetic storage media, noise analysis 3=17030
- plasma 3=5653
- random, in linear systems, statistics 3=16492
- quantum fluctuations from driven state 3=9360
- quantum, in parametric processes 3=4264
- radio reception, thermal and quantum noise 3=2119
- "red noise" power spectrum 3=16539
- shot, grid-current noise, pulse amplifier 3=16891
- spectrophotometric noise, filtering 3=11913
- in solids, conference, Minnesota (1962) 3=6446
- thermal, single-domain magnetic particles 3=15727
- vision, brightness and colour discrim. 3=5303
- Y ferrite, noise 3=20631

electrical

- a.c. electrometer as noise-spectrum analyser 3=21681
- amplifiers, linear, quantum noise deriv. 3=5837
- amplifiers, low-noise, quantum effects 3=5839
- in amplifiers, radioastronomical 3=5840
- e.m. in non-steady state plasma, theory contrib. 3=4172
- earth currents, man made, ~ 1 sec period 3=23578
- elec. conductor, spectral distrib. analysis 3=5615
- ferrite sphere, at ferromagnetic resonance 3=6739
- h.f. noise elimination for radio pulse transmission 3=7713
- heterodyne spectral noise analyser 3=19163
- impurity semicond., generation-recomb. noise 3=22914
- maser systems, noise limits 3=5891
- noise in electrodeless gas discharges 3=21725
- noise from plasmas, semi opaque or opaque 3=7536
- noise generator, standard, tunable 3=24162
- noise propag. along electron beam 3=9853
- noise, statistical properties 3=11871
- nonlinear systems, thermal fluctuations 3=11705
- orbital accelerators, use for modulation 3=14697
- photomultipliers, intrinsic noise control 3=14639
- plasma cylindrical column, noise radiation 3=383
- plasma, millimetre wave noise 3=4131
- plasma, non-equilib., cylindrical, power radiation 3=4130
- semiconducting devices, transistor-like 3=13099
- semiconductors, current fluctuations 3=6572
- semiconductors, electron temp., high fields 3=17835
- semiconductors, generation-recombination, Klaassens expression, corrections 3=17834

Fluctuations — contd
electrical — contd

- semiconductors, generation-recombination noise and warm electrons 3=64
- semiconductors, i.f., electron-hole plasma instabilities 3=20281
- semiconductors, i.f., magnetohydrodynamic carrier motion 3=20280
- signal-to-noise ratio enhancement 3=19473
- superconductors, intermediate state, resistance and resistance levels 3=1889
- thermionic convertor, oscillations, origin 3=3995
- triglycene sulphate, critical-pt. polarization 3=893
- white-noise probing, parameter identification 3=11671
- CdS, space-charge limited current 3=8520
- Ge, hot electron noise 3=10770
- Ge, in low-temp. breakdown processes 3=853
- Ge, p-type, generation-recombination and hole capture by Au 3=17852
- Ge single crystals, low temp. 1/f noise 3=4912
- Ge, Cu-doped, current noise at 20°K 3=10790
- Ne discharge, probe noise in various regions 3=14550
- W, filaments, hot 3=17821

Fluids

See also Gases; Liquids.

- Bingham fluid behaviour in cone-and-plate viscometer 3=14114
- Boussinesq approx. applicable to thin layer 3=1660
- canonical partition function, cellular method 3=21292
- cell-cluster theory, Monte Carlo calc. 3=5416
- convection, Nusselt numbers 3=19037
- near critical point, compressibility and co-existence curve 3=3786
- density fluct., freqn. distrib. analysis 3=7140
- dense, kinetic theory 3=1678
- equilibrium of compressible inviscid fluid of varying density 3=1659
- flow, compressible, theory of characteristics 3=98
- flow, generalized equation 3=21296
- flowing, instrument for continuous density meas. 3=7183
- fluidization of fine particles packed in layer condition 3=100
- fluidized bed, diffusion thermal, meas. 3=14111
- fluidized beds, min.-fluidization vel. 3=9420
- fluidized bed, mixing 3=18786
- fluidized beds, multistage, particle residence times 3=16585
- fluidized beds, solid-gas heat transfer 3=7184
- fluidized beds, stratification, equilb. 3=9418
- fluidized beds, structure det. 3=16586
- gravitational field of rotating fluid mass 3=1600
- heat transfer, bilateral, flow in concentric annulus 3=7365
- heat transfer, calc. substitution separation method 3=14393
- higher-order effects, theory 3=1655
- hole theory, from molecular distributions 3=16576
- hydrodynamics of rotating polytropic fluid 3=16577
- incompressible viscous fluids, hydrodynamics, Lagrangian eqn. 3=16588
- kinetic theory of dense fluids 3=1677
- laminar flow, dispersal theory 3=23847-8
- magneto-sonic wave excitation, conducting 3=17037
- Maxwell, rectilinear, in straight tubes of arbitrary cross-section 3=14105
- mechanics, dim. analysis, use of governing eqns. 3=16578
- mechanics of forced motion due to immersed solids 3=11753
- non-Newtonian, flow, rel. to second law of thermodynamics 3=11769
- non-Newtonian, stability theorem 3=14097
- nonpolar, theory of dielec. const. 3=16575
- nonuniform, statistical thermodynamics 3=7135
- nuclear mag. resonance, fluids, effect of molec. orientation in elec. field 3=14188
- packed beds, pressure-drop eqn. 3=9419
- pair distrib. in rigid-sphere system, by particle-scaling method 3=3785
- power-law flow past accelerated plane wall 3=11756
- Percus-Yevick integral eqn., soln. 3=14138
- radial distrib. functions from integral eqns. and Monte Carlo 3=1656
- radial distrib. functions for long-range forces 3=14137

Fluids — contd

- relativity, general, discontinuities, appl. 3=23755
- rotating, energy transfer by wave reflection 3=11758
- rotating, steady plane fronts 3=16583
- stratified, appl. in meteorology 3=5405
- stratified waves, theory, including gravity and rotation effects 3=21295
- superposability and self-superposability 3=14096
- superpotential and supermatrix of heterogeneous ellipsoid 3=1595
- theory, classical 3=5417
- transfer (heat, mass, momentum) near boundary, mixing model 3=14104
- transport by diffusion and sedimentation 3=9377
- turbulence, isotropic, energy transfer 3=5413
- viscoelastic, axially-symmetric flow 3=11770
- viscous media, paramag. relaxation time 3=1713
- vortex filament, progressive deformation 3=11759
- waves, hydromagnetic, in inhomog. fields 3=17034

Fluorescence

See Luminescence.

Fluorescent screens

See Luminescent devices.

Fluorine

- atoms of F¹⁹, h.f.s., unrestricted Hartree-Fock calc. 3=12760
- chemical reactions, atomic, gaseous, substitution in CF₄ 3=21005
- μ-polarization, search 3=15314
- polarization of fluorine nuclei in Teflon, rel. to microwave power and n.m.r. frequency 3=25580
- F¹⁹, n.m.r. relaxation time in LiF 3=25584
- F⁻ gaseous ion, absorption spectrum 3=12759
- F, crystals, librational motion 3=745
- Fluorine compounds**
 - fluorides, iron-series, h.f.s. in magnetic resonances 3=15955
 - fluorocarbons, F coupling consts., relative signs 3=15377
 - nuclear magnetic resonance, F¹⁹ chemical shift 3=25590
 - F₂CO, microwave spectrum and vibr. states 3=12836
 - F₂HC-CDHF, spectrum, 7-25 kMc/s, Stark modulation 3=17593

Foams

See also Bubbles.

- disperse systems, ionization equilibrium 3=21696
- films, black, structure and stability 3=9433

Fog

- and atmospheric electricity, pot. gradient, Poona, IGY 3=18514
- granularity meas. by light scatt. 3=21009
- growth rel. to time, and 0.35-10 μ absorption 3=1436
- radiation fogs, vertical structure 3=1442

Force

See Dynamics.

Force measurement

See also Dynamometers.

- microbalance, 2-component, for forces on ion-bombarded surfaces 3=23829
- rotating elastic member, resonant, non-linear 3=14091

Fourier analysis

See also X-ray crystallography, calculation methods.

- continuant matrices, analytic functions eval. 3=10
- e.m. pulse diffraction by half-plane 3=24470
- liquids, X-ray diffr. data 3=18799
- observation sequences, average lagged product/cross spectrum relationship 3=21199
- transform zeros, rectangular pulse, demonstration 3=9320

Fourier series

See Series; Transformations, mathematical.

Fractionation

See Distillation.

Fracture

See also Mechanical strength.

- aggregate material, two fracture modes, statistics 3=1243
- brittle solids, fragment size in single fracture 3=1239-41
- brittle bodies, time depend., in surface active media 3=25642
- ceramics, cryst., crack formation and propag. 3=23356
- ceramics, polycryst., microstructure effects 3=23357

Fracture—contd

- ceramics, insulators, electrical, thermal shock resistance 3=17675
- crystals, insulators, electrical, thermal shock resistance 3=17675
- crystals, review 3=25626
- diamonds, cleavage, review, defect effects 3=23362
- energy release from slip bands 3=1242
- glass breakage by sonic booms 3=16692
- glass, delay time, rel. to cracks 3=3243
- heterometry, crystal morphology rel. to cracks 3=13384
- and loading duration 3=23329
- Lucite, spalling mechanism 3=11180
- meas. by replica, etch-shadow extraction, for electron microscopy 3=16007
- metals and plastics, stresses, from eqn. of state 3=8761
- metals and plastics, creep and rupture, parameters 3=8761
- metals, brittle strength, rel. to surface structure 3=20756
- metals, ductile, mechanism 3=11177
- metals, fatigue, low cycle, review 3=13376
- photoelastic materials and glass, brittle, theory 3=23363
- polymers, mass-spectrometric obs. 3=18211
- polymethyl methacrylate, fracture surface energy 3=11179
- polymethylmethacrylate, rupture factor 3=3235
- polystyrene, fracture surface energy 3=11179
- propag. in brittle materials, crack elasticity model 3=13381
- propag. velos., instantaneous, meas. method, for electrically conducting materials 3=13382
- rubber, tearing, molecular mechanism 3=5074
- source in dislocations, incipient crack theory 3=23355
- steel (carbon), fatigue fracture surfaces electron microscope study 3=1244
- surface energy determ. by cleavage technique 3=11179
- surfaces of maximum shear, theory 3=3773
- by thermal stress, due to electric breakdown 3=8565
- vitreous polymer, kinetics under external load, calc. 3=20731
- Al alloy 24S-T fatigue and impact fracture 3=3244
- Al alloys, fatigued, two-stage mechanism 3=20741
- Al, creep, obs. by electron microscope 3=8782
- Al, fatigued by const. cyclic strain 3=20742
- Al, mosaic block disorientation 3=10682
- Al₂O₃, fracture strength, low temp. 3=23351
- Be, in tension, 20-500°C 3=3220
- Cd, polycryst., -269°-23°C meas. 3=15994
- Co-CW alloy, abrasion, surface fracture 3=5075
- Cu, fatigue failure under cyclic stress 3=1245
- Cu, fatigue fracture 3=3244
- Cu, hard-drawn fine wires, lattice dilation 3=18212
- Cu-Ni system at 700-1150°C 3=15996
- Fe, Armco, ductile cleavage fracture 3=11176
- Ge, cleaved surfaces, tear marks 3=23382
- Ge, fracture strength -196° to 500°C 3=23351
- LiF, on (110) planes 3=23354
- MgO, rel. to slip 3=6802
- MnNi, under bending stress rel. to disordered structure 3=6790
- Ni, effect of dissolved H 3=11153
- Ni, 500°C, compressive prestrain effect 3=13361
- Ni-Cr, mechanisms 3=3239
- Ni, 500°-600°C, effect of impurities 3=25631
- Si, single crystals, mechanism 3=23360
- TiC-WC-Co alloys 3=18184
- U, single crystals, -196°C, tension 3=15989
- W, cast, effect of recryst. anneal 3=11183
- W, grain boundary rupture, at high temp. 3=13368
- W, surface, rel. to twinning 3=18210
- WC-Co carbides, sintered, mech. 3=11178
- Zn, polycrystalline, in tension 3=18200

Francium

No entries this year

Free radicals

- acetyl-L-glutamic acid product after γ -irrad., e.s.r. 3=3164
- $\alpha\alpha$ -diphenyl- β -picrylhydrazyl, antiferromagnetism 3=18117
- aromatic, g factors theory 3=20029
- aromatic, electronic relaxation, from e.s.r. in two organic solvents 3=14183

Free radicals—contd

- aromatic, sign of C¹⁴ coupling consts. 3=15384
- aromatic, unpaired-electron coupling with nuclear motion 3=8309
- azulene anion, e.s.r. spectrum, erratum 3=8310
- benzyl, e.s.r. in polycrystals, second moment 3=25560
- bipyridyl, biquaternary, spin densities 3=2654
- butane, unimolecular reactions of excited molecules 3=4766
- carbonyl anion, e.s.r. 3=6429
- carbonyl, i.r. bands, splitting due to water 3=8283
- in cryogenic solids, flame propagation, effect of crystalline-phase transformation rates 3=5161
- cycloheptatriene cycloheptatrienyl, structure by e.s.r. 3=4778
- cyclohexadienyl, formation by reaction of H with solid benzene 3=1388
- cyclohexadienyl, e.s.r. spectrum 3=12859
- cyclohexadienyl, e.s.r., h.f.s., hyperconjugation mechanism 3=22591
- cyclohexadienyl, spin densities 3=12875
- decay in irradiated polyethylene 3=2671
- dinitrobenzene anion, e.s.r. linewidth alternation 3=4776
- dibenzo-p-dioxin, e.s.r. h.f.s., p and C¹³ 3=20017
- from DNA bases, yields, rel. to γ -irrad. 3=22606
- ethyl, heat of formation 3=20978
- ethyl-d, chem. activated, decomposition 3=11347
- ethyl-d, isotope effects in decomposition 3=16154
- ethyl, reactions with I atoms 3=8972
- e.s.r. spectra, anomalous alternating linewidths 3=2653
- from γ -irradiated small molecules at low temp. 3=12874
- glycylglycine HCl, irradiated crystals 3=15942
- heteroatom radicals, SCF calc. of spin-density distrib. 3=10530
- hindered internal rotation and e.s.r. spectra 3=12861
- isobutyl, isomerization 3=8948
- in irradiated benzene and derivatives, e.s.r. 3=2670
- ionization and dissociation energies 3=8303
- isobutyl radicals, thermal reactions 3=3390
- ketyls, spin distrib. 3=4777
- lifetime, effect on e.s.r. 3=8311
- mercaptosuccinic acid, e.s.r. of γ -irradiated crystal 3=13304
- monochloroethyl and trichloromethyl radicals, recombination and disproportionation 3=8974
- nitrile anion, spin-density distrib. 3=6428
- n-octadecyl disulphide, γ -irradiated 3=6416
- nuclear relaxation, in molecular liquids 3=21411
- organic, in solution, Overhauser effect and relaxation in weak fields 3=23910
- π -electron, in polycrystals, e.s.r. second moments 3=25560
- polyformaldehyde, γ -irrad., e.s.r. 3=12858
- in polymethacrylate, e.s.r. dependence on γ -dose 3=25563
- polytetrafluoroethylene, irradiated oriented, e.p.r. 3=17608
- production and decay, kinetics 3=25810
- propyl, chem. activated, unimolecular decomp. 3=20993
- pyrene anion, e.s.r. spectra 3=8310
- pyracene, e.s.r. spectra 3=22590
- radiation-induced in frozen aq. solns. of S cpds., e.s.r. 3=15392
- radiation-induced in sulphur cpds., e.s.r. in polycryst. state 3=3413
- sec-butyl, collisional energy transfer in rare gases 3=12878
- sec-butyl, collisional energy transfer with molecules 3=12879
- sec-butyl, produced by chem. activation at different levels of vibrational excitation 3=8965
- solns., dilute, e.s.r. spectra, line-widths theory 3=23911
- solutions, e.s.r., and h.f.s. 3=14183
- solvent effects in e.s.r. 3=6415
- t-butoxy, decomposition rel. to pressure 3=3385
- tetramethyl ammonium chloride, irradiated crystal, e.s.r. 3=8716
- thioxanthone S,S-dioxide, e.s.r. of mononegative ion 3=2655
- trapped H and D atoms in γ -irradiated ice 3=2669

Free radicals—contd

- triphenylmethyl, e.s.r., spin densities, corrections 3=20018
- 2,2'-dipyridyl anion, e.s.r., h.f.s., effect of reducing agent 3=20020
- viologens, high-resolution e.s.r. spectra 3=20028
- Wurster's blue perchlorate, mag. susceptibility 3=11034
- zero-field electron magnetic resonance 3=17609
- CBr, absorption spectrum near 3000Å 3=25092
- CD₃, abstraction of primary, secondary and tertiary H atoms 3=3384
- CH₂, ionization potential 3=360
- CH, spectral band blackening in hollow cathode 3=19936
- CH, spin densities 3=12791
- CH₂-(CH)₃=CH₂, C atom spin densities 3=15393
- C₂H₂, e.s.r. 3=15372
- CN, excited, microwave transitions, optical detect. 3=6390
- CN, rotational temp. meas. 3=12846
- CO₃⁻, trapped, structure and spectra 3=6418
- DO₂, e.s.r., from D₂O₂ solns., 77°K, u.v. irradiated 3=20012
- DPPH, nuclear relaxation in molecular liquids 3=21411
- DTBN, nuclear relaxation in molecular liquids 3=21411
- in H₂, D₂, solid, films, prod. by p and d bombardment, 100-1000 V, e.p.r. 3=10550
- HNCN, spectrum and structure 3=8307
- HO, adsorbed by SiO₂, spectrum and heat vars. 3=8922
- HO₂, e.s.r., from H₂O₂ soln., 77°K, u.v. irradiated 3=20012
- ND, two new bands 3=12876
- NH, band system 3=12876
- NH₃, recombination in decomposition of NH₃ 3=8308
- NH₃⁺, h.f.s., mol. orbital calc. 3=15343
- (NH₄)₂HPO₄, irradi., π -electron radical 3=11117
- NH(SO₃⁻) in γ -irradiated K sulphamate, e.s.r. 3=6417
- NO₂, trapped, structure and spectra 3=6418
- O¹⁷, ¹⁸H, dipole moments, h.f.s. 3=12828
- OD, e.s.r., from D₂O₂ solns., 77°K, u.v. irradiated 3=20012
- OH bands in methyl alcohol-air flames 3=12830
- OH, e.s.r., from H₂O₂ solns., 77°K, u.v. irradiated 3=20012
- OH, stabilization in ice, under γ irradiation 3=25150
- S²⁻, reactions with PO₄³⁻, B₂O₃, TiO₂, MoO₃, WO₃, in molten NaF and NaCl, by cryometry 3=8967
- SO, absorption spectrum and dissociation 3=2625

Freezing

- See also Melting; Supercooling.
- alloys, binary, dilute, solute behaviour 3=16838
- cast iron, effect of S, graphitization 3=11300
- detection by thermal analysis and electromag. waves, small volumes 3=16837
- frazil ice, crystal growth rate 3=16039
- hydrogen, para, pressure-density-temp. relations, up to 350 atm. 3=14418
- ice, nucleation process on mica 3=16037
- ice, nucleation process on PbI₂ 3=16038
- liquid \rightarrow glass, thermodynamics 3=12003
- liquid metals, fluidity and cluster formation 3=9437
- metals and alloys, preferred orientation 3=1269
- metal structure, replication on diamonds 3=8811
- moist medium at const. surface temp., theory 3=1868
- solid-liquid interface study during process 3=23393
- velocity, acoustic waves, u.s., anomalous increase, nucleus size 3=18251
- water drops, submicroscopic, temp. 3=5082
- water, phase transformations, sorbed on Si gel, n.m.r. obs., to -100°C 3=19069
- water, supercooled, spongy ice formation 3=3928
- wet ground, classical Stefan problem, numerical integration 3=24111
- Al, fluidity and prefreezing cluster formation 3=9437
- Au-Cu, solidification curves 3=12002
- Bi, high-purity, as temp. standard 3=9642
- CuAl₂-Al eutectic alloys, grain structure 3=11283
- Fe-Au alloys, liquidus-solidus relns. 3=11285
- Fe-Ir alloys, liquidus-solidus relns. 3=11285
- Fe-Os alloys, liquidus-solidus relns. 3=11285
- Fe-Tc alloys, liquidus-solidus relns. 3=11285
- He³, liquid-solid transform. anomalous 3=3937
- KCl, aq. soln., pre-freezing effects 3=3927
- NaOH aq., rel. to solubility 3=7387
- Sn-Ag alloys, solute distrib. after solidification 3=16119
- ZnCl₂, aq. soln., pre-freezing effects 3=3927

Friction

See also Internal friction.

- alloys, high temp., due to oxide layer 3=20764
- brittle crystals, abrasion, friction rel. to wear 3=11188
- Coulomb, eqns. of motion of systems with 3=1647
- Coulomb's law and microhardness 3=13388
- crystal, moving dislocation 3=17728
- diamond sliding on lead 3=13388
- dielectric friction on a moving ion 3=12294
- dielectric friction of rotating dipole 3=12295
- electrographite 3=8787
- electrographite on Cu, surface and crystal-structure changes 3=6807
- and gases, flow, with heat transfer, uniform channel 3=14194
- gases, polyatomic, dilute; molecular 3=1724
- liquid friction const. from flow anisotropy 3=21316
- meas., bet. rotating drum and sample 3=8788
- meas., in ultra-high vacuum, by inclined-plane 3=9403
- measurement of coeff. during continuous rubbing 3=20763
- measurement at ultrahigh vacuum 3=25647
- mechanical systems, general law of motion 3=1648
- metals immersed in liquid Na 3=1249
- polymers, up to few 100 cm/sec, -60 to + 300°C 3=16012
- polymers, two-term law, on steel 3=13387
- PVC, rigid and plasticized 3=11192
- rubber, var. temps. and velos., relation to viscoelasticity 3=16013
- sapphire on steel, erratum 3=11191
- skin-friction in gas flow, effect of gas-injection 3=23919
- Teflon, on Teflon and steel, effect of pressure 3=6808
- wear particle, viscoelastic, between sliding surfaces 3=16564
- CCl₄, liquid friction const. 3=21317
- He II, between superfluid and normal components 3=21645
- He II, superfluid and normal components 3=5571
- Si, surface rubbed, density of surface traps 3=13065

Functions

- Green's, for fermion systems with pairing correlations 3=3767
- Legendre, associated, discussion 3=23727
- reactor spatial dynamics, transfer function synthesis 3=2531

Fundamental concepts

See Physics fundamentals.

Fundamental constants

See Constants.

Fundamental particles

- See also Baryons; Field theory, quantum; Leptons; Nucleons and antinucleons; Nucleus; Particle detectors; Quantum theory; Scattering, particles; and individual particles, e.g. Electrons, Mesons.
- antiparticle concept, principle of symmetry 3=24623
- arbitrary spin, motion in inhomog. e.m. field 3=5924
- and astrophysics, relativity, general, cosmology, review 3=23652
- baryons and strangeness, compound model 3=17173
- Bethe-Salpeter eqn., spinor, complex ang. momentum 3=22086
- bootstraps and the pion-nucleon system 3=24613
- boson eigenstates in generalized Kemmer-Dirac equations 3=19545
- boson e.m. decay and baryon mag. moment, from unitary symmetry elementary particle model 3=12396
- boson-fermion doublets interact., renormalizations 3=22068
- boson fields, zero-mass, in universe 3=23660
- boson-isoboson, boson-isofermion, resonances 3=7787
- bosons, heavy, decay props. 3=2227
- bosons, intermediate, prod. by neutrinos, calc. 3=19609
- bosons, intermediate vector, photoprod. 3=10074
- bosons, intermediate, W[±], e.m. props., appl. of ξ -limiting process 3=553
- bosons, spin $\frac{1}{2}$, measurable elec. charge 3=14880
- bosons, from ν absorpt. in nuclear Coulomb field 3=10086
- bosons, Pauli-Villars regularization 3=2202
- bosons, vector, copious production, possibility 3=17231
- bosons, vector, mediating decay processes, radiative corrections 3=2228
- bispinor theory rel. to spinor theory in Riemann space 3=4328

Fundamental particles — contd

- causality definition rel. to strangeness 3=5330
- charged, with mass between electron and muon, search 3=22094
- charge symmetries as R_3 subgroups 3=19548
- charged, electrostatic—grav. equil. model 3=2185
- charged, energy loss in medium by longitudinal wave emission 3=2238
- charged, beam, geometrical props. 3=12256
- charged, distrib. in beam storage systems 3=12255
- χ boson coupling only with Λ and μ 3=555
- classification based on massless Dirac field 3=7772
- classification on nonlinear field-theoretic basis 3=22056
- classification of particles and resonances 3=14871
- collision cross-sections, with large absorption 3=24647
- composite, coupling const. formulation 3=19551
- composite model, divergence-free 3=7817
- composite, nonrelativistic theory 3=12395
- composite particles, Lagrangian theory 3=547
- composite structure with e.m. forces 3=23769
- conference, high-energy physics, Geneva (1962) 3=7815
- conference, in recent European contribs., London (1963) 3=14925
- constants and laws, relation 3=14926
- Coulomb field, relativistic perturbation theory 3=4353
- coupling consts., direct meas. method 3=24594
- decay at ultrahigh energies in condensed matter 3=22095
- decay of heavy bosons 3=2227
- decay processes mediated by vector bosons, radiative corrections 3=2228
- decay processes, multipole expansions 3=24625
- definition, discussion 3=4362
- description in qu. field theory 3=2189
- detective theory rel. to number of elem. particles 3=24590
- Dirac difference eqn., covariant 3=12392
- Dirac eqn. for Coulomb potential, anomalous solns. 3=16525
- Dirac magnetic monopole, search for 3=10069
- Dirac monopoles, exptl search 3=14861
- Dirac particles, gyro-gravitational ratio 3=17180
- Dirac particle, spin angular momentum 3=7771
- eightfold way, baryon—baryon interactions 3=24604
- elastic ether theory with intrinsic ang. momentum 3=544
- from electron—positron interactions 3=24692
- elementarity study, use of various eqns. 3=19544
- energy losses in medium, radiative corrections 3=14929
- equivalence of 3 scalar theories of 3 scalar particles 3=22059
- excited state masses and charges in Fermi—Yang model 3=17224
- fermion—isofermion, fermion—iso-boson resonances 3=7787
- fermion Regge poles 3=14878
- fermions, bound state by pure repulsive forces 3=19562
- fermions, chirality rel. to elec. charge in second-order theory 3=22064
- fermions, Green's functions for systems with pairing correlations 3=3767
- fermions, mass, in γ_5 invariant theory 3=22063
- form factor data, rel. to Regge poles 3=566
- four fermion interact., weak 3=7780
- four-particle final state, isotopic relations for reactions 3=24617
- functional theory of corpuscles 3=17175
- γ_5 invariance 3=19546
- Gell-Mann—Okubo mass formula, deriv. 3=14874
- general covariance, rel. to theory of interactions 3=10032
- generalized field theory, structure 3=19541
- generation of three particles, role of short-range forces 3=14920
- global symmetry, possible group schemes 3=14868
- graviton of spin 2, 1, 0, from electron inertial tensor 3=28
- graviton, stability against radiative decay 3=29
- group theory, invariant operators, Casimir type 3=3707
- group theory, mathematical basis of physical techniques 3=4308
- hadrons, leptonic decay 3=24611

Fundamental particles — contd

- Heisenberg's nonlinear theory, interpretation of τ -functions 3=2188
- Heisenberg-type nonlinear unifying eqns., deriv. 3=10024
- helicity, spinor space interpretation 3=24592
- hexagonal representation with planes of const. charge, baryon number and hypercharge 3=17169
- high-energy charged, detection possibility 3=4368
- high-energy processes, rel. to moving pole hypothesis 3=5960
- hypercharge and degeneracy rel. to isotopic spin 3=4431
- hypothetical vortex model 3=22055
- interaction amplitudes, singularities 3=4352
- interactions, ang. distrib., isotropic, 45-prong case in cosmic rays 3=19596
- interactions, classical and relativistic mechanics 3=17168
- interactions in isospace $\mathcal{H}(R_3)$ 3=24598
- interactions, strong, resonances, review 3=24670
- interaction symmetry prediction from dispersion relations 3=17219
- interactions, upper limits, from Lehmann vertex function representation 3=19539
- interaction via Bose field 3=24607
- internal structure of physical fields 3=22052
- irreducible internal variables 3=7775
- isobaric spin algebra 3=11667
- isobaric spin space 3=22060
- Kemmer-algebra and Foldy—Wouthuysen transformations, spins 0 and 1 3=14859
- Klein paradox 3=2191
- Lee model, dressed particle picture 3=12383
- Lee model, elementary and composite particles, distinction 3=17171
- Lee model, Lorentz covariant 3=5911
- Lee model, magnetic moment 3=4323
- lepton with anomalous mag. moment, mass 3=542
- leptonic space with additive muonic no. 3=5926
- Lie groups, simple, and Wigner—Eckart theorem 3=17177
- lifetimes, short, meas. with background, statistical estimation 3=24669
- Low's model, equivalence 3=17170
- Mandelstam represent. for four-point function 3=5941
- Mandelstam representation, modification for heavy particles 3=5921
- mass, one-dimen. model with 4-fermion coupling 3=4330
- mass, rel. to gauge invar. of vector field 3=5919
- mass spectrum and general relativity 3=14873
- massless particles, electromagnetic interactions 3=551
- mass levels, including resonance states, formula 3=541
- mass quantization, test 3=24596
- mass spectrum, using pseudoscalar parameters 3=17167
- mass quantization, bilocal field theory 3=17172
- model with two neutrinos and high symm. 3=24589
- modern theory, predicative power 3=4362
- multiple production, and nonlinear scalar fields 3=19592
- new isobaric spin group 3=2226
- nonlinear scalar field eqn., approx. solns. 3=12393
- nuclear structure physics interrelation 3=540
- observable consequences of anomalous thresholds 3=24593
- parafermi rings, representation theory 3=23788
- parity, strangeness, isotopic spin, connections, various models 3=22057
- particle and antiparticle, total cross-section asymptotic equality 3=17197
- particles with two mass states, interaction with e.m. field 3=2187
- phase volume, invariant, for N particles 3=14885
- photon and electron high-energy physics, review lecture 3=14932
- pion as baryon—lepton discriminator in symm. world 3=24588
- production, multiple, e.m. processes 3=19593
- production of 3 low-energy particles, production amplitudes 3=550
- proton—proton scattering amplitude, nucleon—nucleon coupling const. 3=19625
- quasiclassical particles, in periodic field 3=4331
- radiation damping theory, classical limit 3=7806

Fundamental particles — contd

- Regge asymptotic amplitudes, simplicity 3=17214
 as Regge poles 3=14862
 Regge trajectories and elementary poles 3=10048
 relativistic, observables 3=4321
 relativistic quantum theory with variable mass 3=4327
 relativistic rotator, energy eigenvalues of quantized states 3=17188
 relativistic rotator model, resonances as internal excited states 3=5971
 relativistic rotator model, weak interaction 3=19542-3
 representations of particles with zero and "small" mass 3=10027
 resonances, symmetry model 3=554
 resonant isobar conception 3=570
 resonant states, phenomenological theories 3=14872
 resonance states, statistical background 3=24671
 resonances, nature, theories, possible experimental verification 3=14930
 rotator model, as extended structures in Minkowski space 3=4324
 rotator model, relativistic, application of fusion theory 3=17174
 rotator theory, relativistic, vector mesons 3=14884
 Sakata scheme generalization 3=4363
 scattering and multiple production, high-energy 3=5943
 scattering, resonances, overlapping, elimination of interference and bias 3=14931
 space-time approach to particle trajectories 3=14848
 space-time model, real, extended structures 3=4325
 spatially extended, non-relativ. quantum mech. 3=7767
 spatially extended, quantum mechanics 3=21232
 spin, Adair analysis with parity nonconservation 3=2229
 spin ≤ 2 , irreducible wave equation in spherical coordinates, soln. 3=10023
 spin- $\frac{1}{2}$ particles, photon elastic scatt. 3=571
 spin $\frac{1}{2}$, two, interact. with e.m. field 3=591
 spin $\frac{1}{2}$ wave equations in de-Sitter space 3=14882
 spin 1, β_s matrix 3=539
 spin one pole in elastic region of crossed channel process 3=17295
 spin 0, in general relativity, use of complex scalar fields 3=7104
 with spin, soln. of general eqns. in spherical coordinates 3=2230
 spin, Thomas's classical theory 3=5329
 spinning, dynamics in classical and quantum theory 3=23762
 spinor eqns., quantization of two-component higher order 3=4322
 spinor eqns., non-linear, in twisted space 3=4332
 spinors in n-dim., invariant matrix 3=5922
 spurions, group-theoretical assumptions 3=12510
 statistics, from generalized field quantization 3=12388
 strongly interacting systems with hypercharge $Y=0$, symmetry 3=556
 superbarrier reflection 3=4210
 superselection, charge, from random electromagnetic interactions 3=12399
 symmetries, from Wigner coeffs. for SU_3 group 3=6124
 symmetries in two-neutrino theory 3=538
 symmetry breakdown in nonperturbative solns. 3=5925
 tables and references, properties, including reson., up to March (1963) 3=19591
 tables in handbook 3=2146
 Talmi transformation, particles with diff. masses 3=5972
 theory with internal degrees of freedom 3=10029
 three-particle emission, relativistic, analysis 3=22066
 three particles prod. near threshold, ang. distrib. 3=22096
 two-channel reactions, simple model 3=14886
 two-particle prod., interaction cross-sections at thresholds 3=14928
 with two mass states, Lorentz group eqns. 3=2187
 unified classification 3=24591
 unified convergent theory using indefinite metric 3=10028
 unified field theories, development 3=12382
 unified field theory, photons, gravitons and Dirac particles, H_{88} term 3=9341
 unified Hamiltonian theory of relativistic equations 3=10022
 unified models assuming two neutrinos 3=543

Fundamental particles — contd

- unified model, based on neutrino-mixture theory 3=7773
 unified representation, by "global" wave functions 3=10021
 unified representation of a system 3=17176
 unitary multiplet, interactions, weak and e.m. 3=22074
 unitary symmetry, extension, and decay leptonic hyperon 3=15035
 unitary symmetry group, irreducible representations 3=24597
 unstable, Lorentz group representations 3=24595
 unstable objects, new, review 3=4364
 unstable particle prod., cross-section 3=4367
 unstable particles, description in qu. field theory 3=2189
 unstable particles, interaction with e.m. field 3=4335
 unstable particle, coupling const. 3=5923
 unstable, poles and thresholds, posn. on Riemann sheets 3=12394
 unstable, rel. to unitarity and causality 3=10014
 unusual statistics, theoretical possibility 3=7816
 variable mass, relativistic quantum theory 3=4326
 vector bosons, coherent prod. near nucleus 3=10070
 vector fields interacting with Dirac's current 3=548
 vector, mag. moments from photoprod. study 3=5973
 vector particles with oriented spin, theory 3=7774
 vertex functions of $NN\pi$, ΔNK and $\Delta K\pi$ 3=19555
 W^+ , intermediate bosons, e.m. props., appl. of ξ -limiting process 3=553
 Ξ^* , N^* , Y_1^* , Y_0^{*+} , $\frac{1}{2}^-$ octet 3=10173
 yield spectra, two-body final states 3=2224
 zero strangeness theory, isofields eval. 3=2186

Interactions.

See Field theory, quantum interactions; Nuclear interactions. Entries on interactions involving named particles are listed under the particles concerned, e.g. Mesons, interactions; Cosmic rays, effects and interactions.

Fusion

See Heat of fusion; Melting; Nuclear fusion.

Gadolinium

- antiferromagnetism, helical 3=6732
 crystals, anomalous magnetostriction, thermal expan. 3=6715
 crystals, magnetostriction, anomalies 3=6714
 crystals, magnetostriction, anomalous thermal expansion 3=11092
 Curie temperature meas. 3=17022
 ferromagnetic Hall effect, origin 3=15556
 films, magnetoresistance 3=15552
 films, resistance, spin-ordering effects 3=15547
 g-shift and anomalous Hall effect 3=8400
 Hall effect and electrical conductivity, temp. var. 3=8497
 ions, electron spin resonance in BaF_2 3=11111
 ions, Gd^{3+} e.s.r. in CaF_2 3=15943
 Kerr effect in films, temp. depend. 3=2993
 lattice parameters, temp. depend. 3=15444
 mag. susceptibility, 300°-1500°K 3=11033
 magnetic anisotropy 3=15789
 magnetic domains, -5°C, Bitter patterns, wall movement 3=18081
 magnetocrystalline anisotropy 3=1143
 magnetostriction and anomalous thermal expansion 3=15851
 paramagnetic resonance, in Pd and Pd-rich alloys, effect of hydrogenation 3=15944
 specific heat, 0.4°-4°K, meas. and theory 3=8368
 Gd^{157} abundance in meteorites 3=13875
 Gd^{3+} , e.p.r. in glasses 3=20651
 Gd^{3+} ion absorption bands, oscillator strengths 3=19935
- Gadolinium compounds**
 ferrite garnet, etching 3=18240
 $GdAl_2$, mag. moment and Curie pt. 3=991
 $GdAl_2$, n.m.r. rel. to cond. electron polarization 3=1202
 $GdBi_3$, prep., ferromag. props. 3=15776
 Gd-ceric earth mixed garnets, cryst. and mag. props. 3=3125
 $GdCl_3$ ferromag. susceptibility and magnetization meas., 1.5° to 20°K 3=1057
 $GdCl_3$, luminescence, solid and in soln. 3=10988
 $GdCl_2$, magnetocaloric effects 3=15803

Gadolinium compounds — contd

- GdCl₃·6H₂O, paramag. relax., 1.1°–4.2°K, 2–2660 c/s 3=8719
 GdCl₃·6H₂O, spin–lattice relax. 1.1° to 4.2°K 3=3183
 GdCl₃·6H₂O, u.v. absorpt. spectrum 3=10945
 Gd–Co alloys, antiferromag. interactions by magneto–thermal and X-ray meas. 3=1000
 Gd–Er, elec. cond. and mag. phenomena 3=13033
 Gd(EtSO₄)₃, luminescence, solid and in soln. 3=10988
 Gd–Fe alloys, antiferromag. props. 3=1000
 GdFe₂, antiferromag. props. 3=1000
 GdFe₃, antiferromag. props. 3=1000
 GdFe garnet, far i.r. absorption spectrum 3=15680
 GdFe garnet, magnetic anisotropy 3=15787
 GdFe garnet, temp. dependence of mag. props. 3=23188
 Gd iron garnet, mag. structure at low temps. 3=3196
 Gd–Lu, elec. cond. and mag. phenomena 3=13033
 GdMn₂, antiferromagnetic props. 3=15910
 Gd molybdate, red luminescence under u.v. excitation 3=13206
 Gd₂O₃, specific heat and thermodyn. props. 3=20105
 Gd³⁺ perchlorate solutions, hydration geometry, from n.m.r. 3=18832
 Gd₂Pr₂Al₂, magnetic moments 3=991
 Gd₂(SO₄)₃, luminescence, solid and in soln. 3=10988
 Gd–Y alloys, magnetic transitions 3=992
 Gd–Y alloys, microwave resonance results 3=15941

Galaxies

See also Nebulae.

- cluster, luminosity, change with age 3=16417
 clusters, area of sky covered 3=13912
 clusters, white dwarfs in, test of variation in gravitational const. 3=5336
 contraction to relativistic limit, rel. to strong radio sources 3=9258
 "cosmic cycles" theory, constancy of no. of stars 3=5267
 dark matter distrib. 3=11577
 double, value of M/L 3=3606
 dust cloud, intergalactic, in Microscopium 3=16419
 dynamics, stellar, for spherical 3=11580
 early type stars distrib. in Galaxy 3=11578
 elliptical, star formation, role of turbulence 3=9248
 evidence that the galaxy collapsed 3=3607
 evolution 3=5283
 filament connecting 2 galaxies, polarization 3=7039
 Galactic centre, distance to, det. from globular clusters 3=7038
 galactic clusters, stellar rotation 3=3605
 galactic nucleus, radio emission, origin 3=5279
 galactic radiation at 38 Mc/s, survey 3=21133
 Galactic radiation at 4.7 Mc/s 3=9283
 Galactic radio emission, 1.5–10 Mc/s, –42° declination 3=9281
 Galactic system as polytropic sphere 3=13911
 Galaxy, abundance and distrib. of H₂ 3=25974
 Galaxy, and cosmic ray p abundance >10¹⁷eV, spiral arm control 3=24814
 Galaxy, anti-centre, 21cm, and Lindblad's dispersion orbits 3=13928
 Galaxy, derivation of potential 3=11554
 Galaxy, distrib. of 55 H II regions 3=9252
 Galaxy, H distrib., deviation from galactic plane, from 21 cm obs. 3=23712
 galaxy, mag. field 3=1508
 Galaxy, mag. field 3=18646
 Galaxy, magnetic field 3=11583
 Galaxy, mag. field meas. 3=9282
 Galaxy, mag. field strength 3=616
 Galaxy, rotation and structure, cepheid data 3=9246
 Galaxy, rotation of weak stars 3=11582
 Galaxy, scale, local surface density 3=16420
 Galaxy, size, meas. methods 3=18644
 Galaxy, southern, 1440 Mc/s radio survey 3=3624–5
 Galaxy, spiral arms, structure 3=7040
 Galaxy, structural similarity to solar system 3=11509
 Galaxy thickness of gas disk 3=13915
 Galaxy, velocity ellipsoid and Bottlinger diagram 3=16421
 gas expansion from central parts, mechanism 3=16418
 gaseous spiral arms, gravitational instability 3=1534
 globular clusters, limiting radius for stability against galactic forces 3=11581

Galaxies—contd

- halos of radio emission, as transient phenomena 3=23710
 intergalactic absorption 3=3610
 ionized layer about Galactic plane 3=11601
 light-ray deflection in gravitational fields 3=21119
 magnetogravitational theory, two-dim. 3=7041
 mass distribution; surface densities 3=3604
 metagalactic system, matter–antimatter processes 3=3532
 motion of two stars, appl. of third integral 3=1504
 NGC 5128 and 1316, radiation at 4.7 Mc/s 3=9283
 NGC 6166, structure in brightest component 3=5266
 nonsteady-state, dynamics 3=16411
 radio emission, "absolute magnitude" diagram 3=5278
 radio emission of 37 normal southern galaxies 3=25986
 radiofrequency, radiations at 1430 Mc/s 3=25987
 radio-galaxies, review 3=1543
 radio sources, polarization, 3 cm, search 3=18663
 radio wave emission processes 3=11587
 redshift and apparent luminosity change rel. to deceleration 3=3603
 redshift meas., search for systematic errors 3=11576
 rotating cold-gas cloud, gravitation collapse 3=7018
 rotation curves, space densities of Galaxy 3=21118
 southern clusters, stellar props. 3=1533
 spiral arm formation and stability, theory 3=9156
 spiral, force-free mag. fields in arms 3=5825
 spiral structure, quasisteady model 3=23700
 star–gas dynamics, cooperative phenom. 3=13914
 stars, early-type, vel. away from centre 3=13901
 stellar absorption, total to selective ratio, var. with longitude 3=11553
 stellar motion eqns., third integral 3=18647
 stellar motion perpendicular to galactic plane 3=9251
 3C 273 radio galaxy, super-luminous, light var. 3=23695
 UVB system for early-type galaxies 3=16414

Gallium

- adsorption, by Zn, Cd and Sn, crack growth 3=20757
 atom, spectrum, oscillator strengths 3=15279
 conductivity electrical, very pure Ga, temp. depend. at low temps., electron m.f.p. 3=22892
 conductivity, thermal, anisotropy, 83–293°K 3=17671
 elec. resistance rel. to current, 1.2° to 1.4°K 3=17817
 films, preparation, structure and electrical properties 3=17875
 fusion curve and polymorphic transition 3=6814
 liquid, elec. resist. and thermoelec. power 3=23902
 liquid, electron transport props. 3=1710
 liquid, nuclear quadrupole relax. 3=23915
 liquid, solubility of GaSb, GaAs and GaP 3=21333
 liquid structure, near m.p., by positron annihilation 3=21306
 magnetic and magnetoelastic props., temp. depend. 3=5017
 magnetoelectric coeffs., low-field meas. 3=13044
 melting 3=24109
 molten, elec. resist. and Hall effect 3=9475
 neutron coherent-scatt. amplitude 3=25201
 polymorphism at atmospheric pressure 3=8836
 specific heat, 20–700°C 3=22659
 surface fabrication, strain-free 3=25772
 thermal conductivity, 300°–1200°K 3=10611
 u.s. pulse propagation, 62 Mc/s 3=10592
 X-ray spectra, M-bands 3=9593
 Ga³⁺, e.s.r. in LaAlO₃ 3=11112
 Gd³⁺, e.s.r. in Pd with rare earth impurities 3=8709
 Ga³⁺, quadrupole antishielding factor 3=12772

Gallium compounds

- rare earth, gallates, susceptibility, 300–1500°K 3=6693
 semiconducting cpds., solubility in liq. Ga 3=21333
 Ga I or II with Sn, Zn, In, phase diagrams 3=13527
 Ga arsenides, X-ray study, lattice periods 3=20836
 GaAs, absorption, light, and electron effect mass, Fermi energy 3=23070
 GaAs, acoustic excitation, nonlinear 3=17651
 GaAs, atomic heat, 12–273°K 3=12928
 GaAs, behaviour of Li, rel. to Zn and Te doping 3=10818
 GaAs, carrier concentration meas. 3=17878
 GaAs, contamination by quartz 3=1274
 GaAs, crystal growth, reduction of Si contamination 3=13416

Gallium compounds—contd

- GaAs current and Hall coeff. rel. to elec. fld, 4°-30°K 3=10813
- GaAs, current-voltage characteristics 3=17876
- GaAs, Debye temp., neutron scatt. data 3=25201
- GaAs, defects prod. by Li 3=8423
- GaAs density of 3 samples 3=13392
- GaAs diamagnetic susceptibility 3=18058
- GaAs, diffusion of Zn, interstitial-substitutional 3=20225
- GaAs diode, light modulation at 200 Mc/s 3=5895
- GaAs diodes, recombination radiation, depend. on current 3=13091
- GaAs, diodes, maser, electroluminescence, mag. fields, shift, 90 kG 3=20542
- GaAs, diffusion of Sn and Se, meas. 3=22809
- GaAs, dissociation pressure 3=25815
- GaAs, doped, fluorescence spectra, 77°K 3=8617
- GaAs, doping behaviour of Se, model 3=12942
- GaAs, e.s.r. of Fe, meas. 3=11113
- GaAs, effective electron mass, from Faraday effect, i.r. 3=17986
- GaAs, elec. cond. and viscosity, at and above m.pt. 3=5448
- GaAs, elec. props. 1.8°-300°K 3=10814
- GaAs, electro-optical effect, 900 kc/s 3=23051
- GaAs, electro luminescence, injection, polarization 3=23120
- GaAs, electron effective mass, depend. on density 3=17885
- GaAs, electron and hole scattering 3=17884
- GaAs electron emission, high-field 3=9827
- GaAs, electron transfer 3=20044
- GaAs, emission line narrowing, rel. to exciton binding 3=15659
- GaAs, epitaxial films, vapour phase reaction 3=11239
- GaAs films, preparation 3=17875
- GaAs, galvano- and thermomagnetic effects, on n-type 3=10817
- GaAs, grown from vapour phase, X-ray studies 3=13404
- GaAs growth from Ga, zone-melting technique 3=23410
- GaAs, high defect concn. 3=791
- GaAs, i.r. absorption spectrum, phonon peaks 3=10947
- GaAs, internal force consts. calc. 3=10580
- GaAs junction diodes, line narrowing of emitted radiation 3=15601
- GaAs junction, laser action 3=9982
- GaAs junctions, laser action, coherent emission 3=4966
- GaAs, laser, injection, line width, var. current 3=14808
- GaAs lasers, spectral output of "Fabry-Perot" modes 3=23052
- GaAs lattice absorption i.r. bands, shell model applic. 3=10927
- GaAs, length changes, rel. to irradiation and annealing 3=22861
- GaAs, magneto-optical Faraday effect, i.r., and effective electron mass 3=17986
- GaAs, maser, optical, injection, quenching 3=22015
- GaAs, Mg ionization energy 3=4922
- GaAs, Mn e.s.r. at 77°K, meas. and theory 3=3177
- GaAs, n.m.r. of Ga^{69,71}, As⁷⁵, linear Stark effect 3=8735
- GaAs, n.m.r. quadrupole splitting, rel. to electric field 3=23199
- GaAs, optical refl. for 1.5-25 eV photons 3=8584
- GaAs, P diffusion and GaP-GaAs formation 3=20227
- GaAs, p-n junction as diode and photocell 3=17914
- GaAs p-n junction, forward biased, stimulated emission, 77°K 3=7735
- GaAs p-n junctions, avalanche breakdown meas. 3=6574
- GaAs p-n junctions, electroluminescence, and tunnelling 3=20543
- GaAs, p-n junctions, photon emission, tunnelling-assisted 3=4933
- GaAs, p⁺-on-n junction, voltage breakdown as function of n-resistivity 3=13085
- GaAs, paramagnetic resonance centres, in high concentrations 3=20647
- GaAs, photo-Hall effect in high resistivity crystals, temp. depend. 3=6632-3
- GaAs piezoelectric crystals, reflection light, harmonic prod. obs. 3=18956
- GaAs recombination luminescence excitation, by maser 3=20538

Gallium compounds—contd

- GaAs, quadrupole spin transitions 3=8747
- GaAs, recombination radiation obs. 3=4921
- GaAs, reflection spectra rel. to band struct. 3=925
- GaAs, reflectivity and refractivity 3=6641
- GaAs reflectivity spectra, visible and u.v., fine structure and temperature dep. 3=10909
- GaAs : Se, electron conc., 650-1100°K 3=22945
- GaAs, semiconducting 3=20476
- GaAs, semiconducting diodes spectrum, 2.1°K. donor-acceptor absorbt. 3=25458
- GaAs, semiconducting, oscills. due to deep levels 3=15583
- GaAs, semiconducting props., temp., mag. field, var. 3=25364
- GaAs semiconductor optical maser 3=9971
- GaAs, solubility of Zn 3=16122
- GaAs, spectrum, recomb. radiation, 77-300°K, diode 3=17990
- GaAs, spontaneous and stimulated emission 3=25495
- Ga-As system, phase equilibrium 3=11199
- GaAs, Te-doped, constitutional supercooling and facet formation 3=12980
- GaAs : Te, electron conc., 650-1100°K 3=22945
- GaAs thermal expansion, anomalous negative low-temp. values 3=10603
- GaAs, tunnel diodes, degradation, rel. to current and voltage 3=20359
- GaAs, valence band, l.c.b.o. method 3=779
- GaAs, valence band structure, model 3=2753
- GaAs, vapour growth in polar direction 3=20806
- GaAs-Ge tunnel heterojunctions, phonon and polaron interaction 3=6609
- GaAs_xP_{1-x}, electroluminescence 3=11008
- Ga(As_{1-x}P_x) junctions, forward biased, coherent emission, 77°K 3=7734
- GaAs_{1-x}P_x semiconducting p-n junctions, resistance, electroluminescence, transition 3=25377
- GaBr, soln., Raman spectra study 3=5444
- Ga_{2-x}Fe_xO₃, magnetic props. in 4-350°K region 3=15777
- GaI-Ga₂I₄-Ga₂I₆ molten system, density and elec. cond. 3=18827
- (Ga, In) As alloys, disordered, lattice thermal cond. 3=25207
- GaN, films, 1-10μ from chloride, in electrical discharge in N₂ 3=13565
- GaO, emission spectrum and thermodyn. props. 3=25093
- Ga₂O₃, heat of formation and specific heat 3=25825
- β-Ga₂O₃, luminescence kinetics 3=15707
- Ga₂O₃ : Cr, luminescence 3=20500
- GaP, bound excitons, Zeeman effect 3=25254
- GaP, diffusion and solubility of Zn 3=10686
- GaP, dissociation pressure 3=25815
- GaP, elec. cond. and Hall effect, 78°-100°K 3=17879
- GaP, electroluminesc. device using carrier injection 3=13221
- GaP, electroluminescence 3=3067
- GaP, epitaxial films, vapour phase reaction 3=11239
- GaP, excitons bound to defects, spectral lines 3=25253
- GaP, n-type, thermocompression bonding of contacts 3=23722
- GaP-GaAs, i.r., absorpt. p,n-type material 3=20477-8
- GaP, i.r. Faraday effect meas. 3=10816
- GaP junctions, Zn diffused, red emission, at reverse breakdown 3=8532
- GaP, luminescence at 1.6°K 3=15708
- GaP, luminescence spectrum, 4.2°K 3=8618
- GaP, optical reflectance for 1.5-25 eV photons 3=8584
- GaP, p-type photocond. analysis 3=15632
- GaP, radiative transitions near band edge 3=10949
- GaP, 3-phonon combination bands 3=20085
- GaP, valence band, spin-orbit splitting 3=20478
- GaS, growth spirals 3=11231
- GaS layer cpd., band structure 3=20330
- GaS, optical absorpt. edge 3=10946
- GaS optical absorption and photoconductivity, 4° to 300°K 3=10950
- Ga₂S₃, specific heat 3=25825
- GaSb, Debye temp., neutron scatt. data 3=25201
- GaSb diamagnetic susceptibility 3=18058
- GaSb diodes, radiative recomb. effects 3=17913

Gallium compounds — contd

- GaSb, elastic constants 3=8751
 GaSb, electron effective mass meas. 3=12936
 GaSb, electron transfer 3=20044
 GaSb exciton and impurity absorption and emission 3=10948
 GaSb films, undoped, sputtered on glass, structure and elec. props. 3=3357
 GaSb, interband Faraday effect 3=8586
 GaSb, n-type, transport props. 3=10819
 GaSb p-n junction, injection electroluminescence 3=15721
 GaSb, reflection spectra rel. to band struct. 3=925
 GaSb reflectivity spectra, visible and u.v., fine structure and temperature dep. 3=10909
 GaSb, reflectivity spectrum fine structure in near u.v. 3=4961
 GaSb, specific heat, 20-700°C 3=22659
 Ga-Sb-Te system, microstructural, thermal and X-ray analysis 3=25732
 GaSe, dislocations, partial, interacting 3=10662
 GaSe, elec. cond. and Hall effect 3=2913
 Ga₂Se₃, films, amorphous structure 3=20915
 GaSe, growth spirals 3=11231
 GaSe layer cpd., band structure 3=20330
 GaSe optical absorption and photoconductivity, 4° to 300°K 3=10950
 GaSe, photoconductivity, impurity, kinetics 3=20412
 Ga₂Se₃, heat of formation and specific heat 3=25825
 GaTe, elec. cond. and Hall effect 3=2913
 Ga₂Te₃, films, amorphous structure 3=20915
 GaTe, optical absorption edge, rel. to temp. 3=3007
 GaTe optical absorption and photoconductivity, 4° to 300°K 3=10950
 Ga₂Te₃, specific heat 3=25825

Galvanomagnetic effects

See Magnetolectric effects.

Gamma-ray spectra

See also Nuclear decay theory.

- backscattering effects 3=14941
 continuous, analysis by matrix method 3=2235
 difference meas. with multichannel spectrometers 3=2236
 of extended source in homog. medium 3=2522
 fallout fission products, dose rate 3=9055
 14 short-lived nuclides 3=19809
 from interacting nuclei 3=6216
 in imperfect crystals, Mössbauer broadening, diffusion effects 3=4859
 metrology, ionometric methods 3=21279
 Mössbauer absorpt. line spectra meas. 3=22100
 μ^- -mesons nuclear radiative capture 3=17488
 on n capture, thermal, for isomers, verification for In¹¹⁶ 3=8114
 from proton and pion nuclear reactions, comparison 3=8102
 reactor shield design 3=12736
 single crystal summing 3=14944
 in space, information from rockets 3=21145
 A³⁸, half-life det. for Cl³⁸ 3=6198
 A⁴⁰, p-bombarded at 5.6 MeV 3=6250
 Ag, fast neutron capture 3=6267
 Ag¹¹² 3=650
 Ag¹¹² 3=24867
 Al²⁷(n, γ)Al²⁸, 14 MeV 3=10366
 Al²⁷(p, γ)Si²⁸ keV resonance 3=8097
 Al²⁷(p, γ)Si²⁸, 992 keV resonance 3=12668
 Ar³⁷, 1S orbital electron capture, theory 3=4589
 As⁷⁰ 3=12624
 Au¹⁹⁸ decay, β - γ correl. 3=6204
 Au¹⁹⁹ 3=658
 Au¹⁹⁹ 3=12643
 Au, neutron capture, 15-300 keV 3=6266
 B¹² de-excitation after B¹¹(d, p)B¹² 3=4664
 Ba¹³⁸ 3=4572
 Ba¹³⁴ 3=15114
 Ba¹⁴⁰ and β -ray spectra 3=8039
 Be⁷ meas., by electronic subtraction. 3=25905
 Be⁹(p, γ)B¹⁰, 336 keV resonance 3=667
 Be¹⁰, two-parameter analysis 3=19767
 Be¹¹⁻¹³, two-parameter analysis 3=19767
 Bi²⁰⁸, on neutron scatt., inelastic, 2.95 MeV 3=8106
 Bi²¹⁴, (RaC) 3=8054
 Br⁸¹ 3=2406
 Br⁸³ 3=19817
 C¹²(p, γ)N¹³ 3=12666
 C¹²(p, γ)N¹³ 3=12666
 C¹²(p, γ)N¹³, 1.5 to 2.0 MeV 3=17465
 C¹²(p, γ)N¹³, 10 to 55 MeV 3=19846
 C¹³(α ,n γ)O¹⁶, excitation function 3=10390
 Ca⁴², half-life det. for K⁴² 3=6198
 Ca⁴²(p, γ)Sc⁴³ 3=17471
 Ca⁴³, internal bremsstrahlung of beta-decay 3=22327
 Cd¹⁰⁷ 3=19819
 Cd^{108,110,114}, quadrupole spherical vibration levels 3=4563
 Cd¹¹⁴, from Cd¹¹³(n, γ), 0.4-9.5 MeV and Cd¹¹⁴ levels 3=24959
 Cl³⁵, following proton capture by S³⁴ 3=19775
 Cl³⁵, from proton capture by S³⁴ at 1214 keV 3=8087
 Co(n, γ), above 3-4 MeV, neutron capture 3=22409
 Co⁵⁵ γ - β correls. 3=6192
 Co⁵⁵, 1107 keV level, from Fe⁵⁴(p, γ), E_p = 770-1100 keV 3=17472
 Co⁶⁰ decay, β - γ correl. 3=6204
 Co⁶⁰ decay in Co-Fe alloy 3=4590
 Cr(n,n' γ), at 0.98-3.31 MeV 3=2466
 Cr⁵¹ 3=22330
 Cr⁵³(n, γ)Cr⁵⁴ 3=19866
 Cs¹³² 3=10295
 Cs¹³⁸ 3=4594
 Cu, from capture of fast neutrons 3=4649
 Cu(n, γ), above 3-4 MeV, neutron capture 3=22409
 Cu, under O¹⁶ and Ne²² irradi., 74-145 MeV 3=24986
 Cu^{63,65}, excited by 36 MeV N^{14,15} ions 3=10260
 Dy¹⁵⁷ 3=22342
 Dy¹⁶⁰, from Tb¹⁶⁰ β -decay 3=19790
 Dy¹⁶⁵ 3=655
 in Er¹⁵⁹ \rightarrow Ho¹⁵⁹ \rightarrow Dy¹⁵⁹ decay 3=4597
 Er¹⁶⁵, electron capture decay to Ho¹⁶⁵ 3=2415
 Er¹⁶⁸ 3=10269
 Er¹⁶⁷ 3=4578
 Er¹⁷¹, beta-decay 3=22344
 Er(n, γ) 3=15209
 Eu¹⁴⁵⁻⁷ 3=8005
 Eu¹⁴⁵ 3=8044
 Eu¹⁴⁷, coincidence, from Gd¹⁴⁷ decay 3=10300
 Eu¹⁴⁹ 3=8045
 F²⁰ decay, γ - β correl. 3=6203
 Fe⁵⁰ 3=648
 Fe(n, γ), above 3-4 MeV, neutron capture 3=22409
 Gd¹⁴⁶⁻⁷ 3=8005
 Gd¹⁵¹ electron capture 3=24906
 Gd¹⁵², populated by Eu¹⁵² decay 3=17417
 Gd¹⁵³, electron capture decay 3=654
 Gd¹⁶⁰(p,p2n)Gd^{159m} 3=6173
 Ge, excited by 36 MeV N^{14,15} ions 3=10260
 Ge⁷⁰, 0⁺ level, double Coulomb excitation 3=10261
 Ge⁷¹, millisec. isomers 3=15134
 Ge⁷⁶, excited by 36 MeV N^{14,15} ions 3=10260
 Ge⁷⁷ 3=7996
 H³(d, γ)He³ 3=17356
 He³(α , γ)Be⁷, 0.42-5.80 MeV 3=24809
 Hf isotopes 3=8051
 Hf¹⁷⁷ after thermal neutron capture 3=8011
 Hg, neutron capture, 15-300 keV 3=6266
 Hg¹⁹⁸, 412 keV radiation, absolute meas. 3=19795
 Ho¹¹⁶, excited by O¹⁶ ions 3=15120
 Ho¹⁵⁵ detection 3=8048
 Ho¹⁶⁵, excited by O¹⁶ ions 3=15120
 I, fast neutron capture 3=6267
 I-p reaction, 100 MeV 3=12591
 I¹²⁷, on neutron scatt., inelastic, 2.95 MeV 3=8106
 I¹³¹ 3=10294
 I¹³¹ from 25-min beta-activity of Te¹³¹ 3=22334
 I¹³² 3=22335
 In¹⁰⁸ decay, γ - γ , β - γ coincidences 3=15150
 In¹¹⁵, harder γ -rays 3=24899
 In¹¹⁶ isomers, verification of theory for isomers 3=8114
 Ir¹⁸⁴, relative intensities of lines 3=12602
 Kr⁷⁶ 3=15144
 La¹³⁸, on neutron scatt., inelastic, 2.95 MeV 3=8106
 La¹⁴⁰ β decay, and Ce¹⁴⁰ levels 3=22307

Gamma-ray spectra—contd

- Li^{6,7}(Li^{6,7}) reactions 3=885
 Li⁷(n,n')Li^{7*} 3=2474
 Li⁷(p,γ)Be⁸, 1.5-11 MeV 3=22378
 Li⁷(p,γ)Be⁸, 2.5 to 9 MeV 3=19845
 Mg²⁴ half-life det. for Na²⁴ 3=6198
 Mg²⁷ 3=2405
 Mg²⁷ 3=6199
 Mn(n,γ), above 3-4 MeV, neutron capture 3=22409
 Mn⁵⁶ and β-γ coincidences 3=8032
 Mn⁵⁶ decay, γ-β correl. 3=6202
 Mo⁹⁵, neutron capture by s and p-wave resonances 3=24958
 N¹⁴, 10.22 MeV level decay 3=17399
 N¹⁶, excited states 3=24862
 Nb-p reaction, 100 MeV 3=12591
 Nb⁹³, neutron capture by s and p-wave resonances 3=24958
 Nb⁹⁴, ^m 3=6168
 Nb⁹⁹, millisec. isomers 3=15134
 Nd¹⁴²(p,2n)Pm^{141m} 3=6173
 Ne²²(p,γ) 3=2449
 Ni, from capture of fast neutrons 3=4649
 Ni(n,γ), above 3-4 MeV, neutron capture 3=22409
 Ni⁵⁸ decay to Co⁵⁸ 3=15143
 Ni⁵⁹ decay, through virtual state 3=19816
 Ni⁵⁹ γ-β correls. 3=6192
 Ni⁵⁹, rel. to virtual electron capture 3=8034
 O¹⁶, low excited states, transition probabilities 3=15104
 Os^{160m} 3=10273
 Os^{191,191m} 3=10312
 P³⁰ decay 3=6246
 Pa³³³, γ-transitions 3=4605
 Pa²³⁴ 3=2395
 Pb, neutron capture, 15-300 keV 3=6266
 Pd^{104,106}, quadrupole spherical vibration levels 3=4563
 Pd¹⁰⁵, modified decay scheme 3=24897
 Pm¹⁴¹, millisec isomers 3=15134
 Pm¹⁵³ 3=4595
 Po-Li neutron source 3=590
 Pr¹⁴¹(p,2n)Nd^{140m} 3=6173
 Pr¹⁴⁴ and level spins, from β-γ correl. 3=22308
 Pr¹⁴⁴, circular polarization and β-γ correl., and spin 3=22270
 Pt¹⁸⁸ 3=8016
 Pt¹⁸², quadrupole spherical vibration levels 3=4563
 Pt¹⁹⁷ decay to Au¹⁹⁷ 3=24913
 Pt¹⁹⁹ decay and Au¹⁹⁹ low levels 3=17422
 Re¹⁸⁴ 3=8014
 Re^{186,186}, neutron capture, 30-350 keV 3=12696
 Re¹⁸⁹, decay, γ-γ coincidence 3=6209
 Rh⁹⁷, decay 3=2408
 Rh¹⁰³(n,γ)/Rh¹⁰⁴, cascade 3=6272
 Ru⁹⁵ 3=19818
 S³², from P³¹ proton capture 3=7989
 S³⁴(p,γ)Cl³⁵, 800-1400 keV p's 3=17469
 Sb-p reaction, 100 MeV 3=12591
 Sb^{113,115} 3=10291
 Sc⁴⁷, mixing ratio, and strong interactions, time-reversal invariance 3=24893
 Sc⁴⁶ 3=10288
 Sc^{46, 50, 50m} 3=12622
 Se^{81, 81m} 3=2406
 Se⁸³ γ-β correl. 3=6192
 Si²⁸ 3=19811
 Si²⁸(p,p'), invest. of 1st excited state 3=22299
 Si²⁸(p,γ)P³⁰, E_p=1375 and 1500 keV resonances 3=6246
 Si³⁰(p,γ)P³¹, 1177 to 1509 keV 3=19774
 Si³⁰(p,γ)P³¹, reson. between 1 and 2.7 MeV p energy, and P³¹ levels 3=12586
 Sm¹⁴⁷, Coulomb excitation 3=19782
 Sm¹⁴⁷(p,2n)Eu^{146m} 3=6173
 Sm¹⁴⁸, from Eu¹⁴⁸ decay γ-rays 3=10265
 Sm¹⁵⁰, after neutron capture 3=10353
 Sm¹⁵⁰, thermal neutron capture 3=15118
 Sm¹⁵⁵ 3=12635
 Sn, fast neutron capture 3=6267
 Sn^{113m} 3=10291
 Sn¹¹⁹, 23.8 keV level, transitions 3=4571
 Ta isotopes, neutron deficient 3=8051

Gamma-ray spectra—contd

- Ta(n,γ) 3=15209
 Ta, neutron capture, 15-300 keV 3=6266
 Ta, under O¹⁶ and Ne²² irradi., 74-145 MeV 3=24986
 Ta¹⁷⁶ 3=15155
 Ta¹⁷⁶, complex spectrum analysed 3=24909
 Ta¹⁸¹(n,γ) at 2.9 MeV 3=6256
 Ta¹⁸³ 3=8012
 Tb isotopes, n deficient, from Ta + p, 660 MeV 3=10302
 Tb(n,γ) 3=15209
 Tb¹⁵⁹, excited by O¹⁶ ions 3=15120
 Tb¹⁵⁹ levels, from Ga¹⁵⁹ decay 3=22340
 Tc⁹⁹, Coulomb excitation 3=19782
 Te¹¹⁹ isomers 3=15151
 Te¹²⁵ 3=19784
 Ti⁴⁵ decay, search 3=17429
 Th²³⁴, 24 day 3=15158
 Tl¹⁹⁹ 3=658
 Tm¹⁶⁹ 3=19791
 Tm¹⁶⁹, excited by O¹⁶ ions 3=15120
 Tm¹⁶⁹ levels, from Yb¹⁶⁹ decay 3=22346
 U, under O¹⁶ and Ne²² irradi., 74-145 MeV 3=24986
 U²³³, transitions 3=4581
 U²³⁵ fission, neutron-induced 3=15242
 U²³⁸ from capture of fast n 3=4647
 V⁴⁷ γ-β correl. 3=6192
 V⁴⁸ 3=19812
 V^{48, 50}, on p capture in Ti, energy levels 3=17406
 W, neutron capture, 15-300 keV 3=6266
 W, under O¹⁶ and Ne²² irradi., 74-145 MeV 3=24986
 W¹⁸³ 3=10225
 Xe^{132,134}, quadrupole spherical vibration levels 3=4563
 Y⁸⁸, millisec. isomers. 3=15134
 Yb(n,γ) 3=15209
 Y-p reaction, 100 MeV 3=12591
 Yb¹⁶⁶ 3=10310
 Zn⁷² 3=24896
 Zr⁹¹, neutron capture by s and p-wave resonances 3=24958
- Gamma-ray spectrometers**
 See also Beta-ray spectrometers; X-ray spectrometers.
 bent-crystal diffrn. monochromator 3=14940
 Cauchois, 4m, for neutron capture γ-rays 3=14943
 Compton rejection type, high sensitivity 3=17236
 difference meas. with multichannel spectrometers 3=2236
 high energy, for space research 3=21146
 multi-crystal pair, viewed by image orthicon, logic treated, proposal 3=19606
 for Ranger 3 and 4 rockets 3=21145
 review of types 1947-62 3=24683
 scintillation, backscatt. effects
 scintillation (NaI), conversion of pulse height to incident photon spectra 3=17237
 scintillation, quality control 3=14942
 semiconductor Ge-Li drifted diode 3=17238
 sum-coincidence, operating characteristics 3=576
 sum-coincidence, stabilization 3=5979
 summed coincidence spectrometer 3=24679
 sum-peak coincidence spectrometer for multiple coincidences, weak sources 3=2234
 two-crystal, for coincidence and summing 3=7746
 2-channel, for geophysical meas. in wells 3=23577
 NaI:Tl crystals mounting, improved
 resolving power 3=528
- Gamma-rays**
 See also Cosmic rays, photons.
 β-γ circ. polarization correls 3=2401
 β-γ coincidences, technique to analyse
 Zr⁹⁵-Nb⁹⁵, Ru¹⁰²-Ru¹⁰⁶ pairs 3=5990
 beta-gamma emission through virtual states 3=2402
 circular polarization meas., multiple scatt. effects 3=12433
 compound nucleus with large ang. mom. 3=6217
 dose-rate above an infinite plane source 3=17423
 dose-rate outside spherical source 3=10279
 E2-M1 mixing ratios 2¹⁺ → 2⁺ transitions, even nuclei 3=15096
 E2 transitions in β- and γ- vibrational bands of even-even nuclei 3=15097

Gamma-rays — contd

- E2 transitions in deformed even nuclei bet. β and γ -vib. states 3=2375
 effective use of radiation 3=2396
 elec. discharge in mag. trap 3=7512
 even nuclei, excited, mag. dipole transitions 3=7981
 excited nuclei from (α, xn) reactions 3=22428
 14 keV, from Fe⁵⁷, search for effect of magnetic field 3=2132
 γ - β coincidence methods of radio-isotope determination 3=15123
 γ - γ ang. correl., mixing ratio δ , sign 3=12674
 γ - γ coincidences in Ag¹⁰⁷(n, γ)Ag¹⁰⁸ 3=15215
 linear polarization, Rayleigh scatt. from K-electrons 3=8213
 linearly polarized beams, prodn., analysis 3=7819
 M1 transitions, *l*-forbidden, E2/M1 mixing ratio 3=10239
 modulation by mag. fields of polarized beam 3=24681
 nuclear interactions, projection operator formalism 3=22362
 nuclear level lifetimes for emission, S(J_iLJ_f) factor 3=7983
 nuclei with A = 152-197 3=8004
 opposite circ. polarization in mag. field, equality of vels. 3=12434
 from π with nucleons, at 7 GeV, in propane bubble character 3=7901
 point sources, e.m. simulation for calc. 3=573
 polarization, circ., by birefringence in crystals 3=14937
 polarization, circular, meas. of high-energy beams 3=5976
 polarization, from Si³⁰(p, γ)P³¹, from photoproton tracks in emulsion 3=8088
 positronium decay in Teflon, γ - γ coincidence, delay meas. 3=4380
 prodn., n capture, possible source of variable energy and high resolution 3=17232
 production from 1-10⁹ GeV N-N interactions 3=4366
 production system for variable energy 3=4370
 pulse production device \sim 1 msec 3=14939
 quasimonoeenergetic source, use of Ba¹³³ 3=24680
 recoil products, separation 3=6929
 source, props. of shut-down reactor 3=25014
 from 3-quantum annihilation of electron pairs 3=24709
 variable energy beam, by Compton scatt. from Al, 3=14938
 velocity constancy, by positron annihilation in flight 3=22098
 Ag¹¹², γ - γ , β - γ coincidences 3=650
 Al (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
 Al²⁶, cascades from 7.220, 7.252, 7.539 MeV levels 3=19773
 Al²⁸ decay, coincidences, and Mg²⁶ levels 3=22295
 As⁷⁰ 3=12624
 As⁷³, excited states, density 3=19781
 Au¹⁹⁸ 3=10274
 Au¹⁹⁷ 3=6458
 B¹¹ proton capture 3=15192
 B¹¹, 2-13 MeV state 3=7986
 Ba^{131m} 3=8000
 Ba^{131m} 3=8001
 Ba¹³⁴, γ - γ coincidences 3=15114
 Be (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
 Be⁹(α ,n)¹²C, γ -ray excit. function 3=10391
 Bi²⁰⁸, three transitions above 1.720 MeV line 3=12603
 Br⁸¹, β - γ , γ - γ coincidences 3=2406
 C¹², from beta-decay of B¹² 3=22326
 Ca(p, γ), 150 MeV 3=10350
 Cd¹⁰⁷, γ - γ , β - γ coincidences 3=19819
 Cd^{113m}, negatron decay 3=24899
 Ce¹⁴⁰, 2.083 MeV two-proton level 3=12560
 Ce¹⁴¹, in Ce double nitrate, intermediate-state reorientation 3=25172
 Ce¹⁴³, γ - γ coincidences 3=10297
 Ce¹⁴⁴, low-energy, intensity meas. 3=10296
 Cl (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
 Cl(p, γ), 150 MeV 3=10350
 Cl³⁵, following proton capture by S³⁴ 3=19775
 Co⁵⁷ decay 3=17431
 Co⁵⁷, in Ce double nitrate, intermediate-state reorientation 3=25172
 Co⁵⁸, effects of nuclear alignment 3=17433
 Co⁵⁸, γ - γ coincidences 3=649

Gamma-rays—contd

- Co⁶⁰ source standardization, for γ - β coincidences 3=7822
 Co^{60m} 3=17432
 Cr⁵¹, delayed-action, in lifetime 3=10258
 Cs fraction decay from U proton fission 3=24995
 Cs¹³⁴ decay to Ba¹³⁴ 3=24903
 Dy¹⁶⁵, γ - γ coincidences 3=10306
 Er¹⁶⁶, rel. to g_R factor of 2⁺ level 3=2391
 Eu¹⁴⁶ 3=12595
 Eu¹⁴⁶, e- γ , β^+ - γ , γ - γ coincidences 3=15117
 Eu¹⁴⁶, γ - γ coincidences 3=8045
 Eu¹⁵⁰, γ - γ coincidences 3=19822
 Eu^{153m} decay, γ β correlation 3=15085
 Eu¹⁵⁸, β - γ coincidences 3=10299
 F¹⁸, low-lying levels 3=17402
 Fe⁵⁷, 123 keV, E2/M1 mixing ratio 3=7995
 Fe⁵⁹ 3=17430
 Fe⁵⁹, γ - γ coincidences 3=648
 Fm²⁵⁴, E2 transitions 3=638
 Gd¹⁵¹, γ - γ coincidences in Tb¹⁵¹ decay, from Ta + p 3=10305
 Hf^{180m}, multipolarities 3=6179
 Hg¹⁹⁸, coincidences, sum relations 3=22350
 Hg¹⁹⁸, lifetimes 3=12642
 Ho(n, γ), capture, 60-500 keV 3=10355
 I¹²⁵ low-energy radiography source 3=21150
 I¹²⁹ decay 3=17414
 I¹³¹, 644-80 keV γ -cascade transition 3=15152
 In^{114m}, two-quantum decay, search for γ - γ coincidences 3=2388
 In¹¹⁵ 3=7999
 In¹¹⁵ decay 3=17437
 In^{116g} decay 3=4568
 In¹²³ 3=4593
 K(p, γ), 150 MeV 3=10350
 Kr⁸³, low-energy M1 transitions, lifetime 3=6172
 La¹³⁷, low-energy M1 transitions, lifetime 3=6172
 La¹³⁸, *l*-forbidden transitions, matrix elements 3=4573
 La¹⁴⁰ β decay, coincidences, and Ce¹⁴⁰ levels 3=22307
 La¹⁴⁰ β -decay, 1.6MeV γ -quanta polarization 3=6207
 Lu(n, γ), capture, 60-500 keV 3=10355
 Mg²⁷, β - γ coincidences 3=2405
 Mg²⁷, γ - γ and β - γ coincidences 3=6199
 Mo⁹⁹ decay, number, from β - γ coincidences 3=8037
 Nb⁸⁶, coincidences 3=22305
 Nd¹⁴⁴, γ - γ polarization ang. correls. 3=12633
 Ne¹⁹, from 1st and 2nd excited levels 3=15102
 Ne²⁰(α , α')Ne²⁰, α - γ coincidences 3=2498
 Ne²⁰(d,n)²¹Na, n- γ coincidences 3=2385
 Ni⁶⁴(p,n)⁶⁴Cu, and Cu⁶⁴ levels 3=12589
 O¹⁸, low-lying levels 3=17402
 P³¹(p, γ)S³², decay schemes of 355, 439 keV resonances 3=8090
 Pa²³³, e- γ coincidences 3=10318
 Pb²⁰⁴, E4 cross-over transition 3=8018
 Pm¹⁴⁵, *l*-forbidden transitions, matrix elements 3=4573
 Pm¹⁴⁵, β - γ , γ - γ coincidences 3=15116
 Pm¹⁵¹, e- γ , β - γ coincidences 3=8042
 Po-Li source, n- γ coincidences 3=590
 Po²¹⁰ 246 and 46.7 keV transitions 3=6183
 Po^{212m} 3=22311
 Pr¹⁴¹ decay 3=17441
 Pr¹⁴⁴ decay, number 3=8039
 Pt¹⁹⁹ decay, γ - γ , γ - β coincidence and Au¹⁹⁹ low levels 3=17422
 Ra, dose rate, cavity chamber meas. 3=24884
 Re¹⁸⁴ 3=8014
 Re¹⁸⁴, γ - γ , γ -e coincidences 3=10271
 Re¹⁸⁷, multipolarities 3=6180
 Re¹⁸⁷, multipolarity assignments 3=8015
 Rh¹⁰², isomeric state 3=15146
 Rh^{104m}, 4.4 min. isomer, decay scheme 3=4569
 Rh¹⁰⁹, multipolarity assignments 3=7997
 Rh¹¹⁰, 5.5 MeV 3=24894
 Ru⁹⁶, β -coincidence, modified decay scheme 3=19818
 Sc (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
 Sc⁴⁵(p, γ)Ti⁴⁶, five resonances 3=10344
 Sc^{50m}, 258 keV 3=24894
 Se⁷⁶, 0.559 MeV level 3=10262

Gamma-rays—contd

- Si³⁰(p,γ)P³¹, polarization of γ-rays 3=15195
 Sm¹⁴³, isomeric state 3=6174
 Sm¹⁴⁷, γ-γ cascades 3=10298
 Sm¹⁵², vib. E1, E2, E3 transition probabilities 3=10241
 Sm¹⁵⁶ 3=17442
 Sn¹¹⁶ cascade de-excitation 3=8098
 Ta¹⁸¹, γ-γ angular correl., 133-482 keV 3=4803
 Ta¹⁸¹, 619 keV level 3=17420
 Ta¹⁸² 3=12601
 Tb isotopes, n deficient, γ-γ coincidences, from
 Ta + p 3=10302
 Tb¹⁶⁰ 3=12599
 Tc⁹⁴ 3=15145
 Tc⁹⁶, coincidences 3=22305
 Te¹²⁵, γ-γ coincidences 3=19784
 Th²³², vib. E1, E2, E3 transition probabilities 3=10241
 Ti (n, γ), 50 keV-10 MeV, γ-ray cascades 3=24948
 Ti⁴⁶, γ-γ directional correl. 3=15142
 Tm(n, γ), capture, 60-500 keV 3=10355
 Tm¹⁶⁹, h.f.s. splitting in oxide crystals 3=2416
 U²³⁵ fission, thermal, time distrib. meas. 3=6307
 U²³⁸, vib. E1, E2, E3 transition probabilities 3=10241
 V⁵⁶, delayed-action, in lifetime meas. 3=10258
 W¹⁸², 152 keV E1 transition 3=657
 Xe¹³¹, low energy transitions 3=651
 Yb¹⁷⁶ isomeric state 3=4579
 Zn⁷² 3=8035
 Zr⁹⁰, 1.76 MeV 0+ level, two-photon decay
 search 3=2387
 Zr^{90m} 3=17432
 Zr⁹⁷ → Nb⁹⁷ → Mo⁹⁷ decay 3=17436

absorption

- See also Mössbauer effect.
 build-up, heterogeneous media 3=24675
 coal, graphitized, rel. to applied pressure 3=20703
 in crystals, pair prodn., coherence effects 3=7819
 density gauge for meas. of water-steam mixtures 3=4689
 E2, rel. to deep-hole states in shell single-particle
 model 3=17449
 impurity atom in crystal 3=25168
 by impurity nuclei in solid solns. 3=8337
 light nuclei, review 3=19831
 meas. of absorpt. coeff., precise 3=19602
 Mössbauer absorpt. line spectra meas. 3=22100
 Mössbauer effect in thin films 3=20060
 Mössbauer effect, review, Nobel prize speech 3=4557
 Mössbauer effect, in Sn-containing poly-
 methylmethacrylate 3=6877
 Mössbauer effect, virtual localized modes obs. 3=4806
 solid solutions, Mössbauer line intensity, effect of
 thermal oscill. 3=3339
 26 to 75 keV in Dy₂O₃ 3=4999
 Al, impurity nucleus, theory 3=20063
 Au¹⁹⁷, recoilless 3=6458
 Fe⁵⁷, 14 keV level, Mössbauer effect 3=25174
 Fe, Si, Fe₂Si₃, mag. study by Mössbauer effect 3=23180
 Ge, impurity nucleus, theory 3=20063
 in He⁴, quasi-deuteron prodn. 3=15052
 Hf¹⁷⁷, resonance absorpt. of 113 keV level 3=12568
 LiH, using bremsstrahlung 3=14948
 O¹⁶ in giant resonance region 3=8077
 Pr¹⁴¹, Mössbauer effect 3=24845
 Sm₂¹⁴⁹O₃, Mössbauer, for 22 keV 3=6459
 Sn¹¹⁹, at 23.8 keV 3=2431
 Sn¹¹⁹, in organic Sn cpds., quadrupole interaction and
 isomeric shifts 3=15415
 Sn¹¹⁹, Mössbauer effect 3=24845
 Sn¹¹⁹, resonance spectra 23.8 keV 3=2368
 Sn^{119m} 23.8 keV state, resonance 3=6141
 SnO₂, resonance spectrum, temp. depend. 3=22628
 Te¹²³, 35.3 keV, hyperfine structure 3=25169
 ZnO, Mössbauer spectrum at 92 keV 3=6460
 Zr_{1-x}U_xFe₂, resonance absorpt. 3=15412
angular distribution
 ang. correl. meas., with multichannel analysers 3=4372
 ang. correls., mag. dipole and elec. quadrupole interact
 effects 3=12614
 angular correlations, α-γ measurement 3=24882
 β-γ correl., rel. to 2⁺ states structure 3=7984

Gamma-rays — contd

angular distribution — contd

- β-γ-γ ang. correl., time reversal test 3=10033
 cascades thro. 2⁺ state in Dy¹⁶⁰, ang. correl.
 perturbs. 3=1155
 correl. meas., eleven-counter instrument 3=7821
 correlation, β-γ, source, liquid, thin, for studies 3=10094
 directional-correl. data, variances 3=19804
 e⁺ annihilation in Be and Mg 3=6503
 γ-γ ang. correl., mag. and inhomogeneous elec.
 fields 3=15132
 γ-γ ang. correl., mag. and inhomogeneous elec.
 fields, interaction operator 3=15133
 γ-γ ang. correls., mag. dipole interact. study 3=10224
 γ-γ correl. in Hf crystals, angl. and temp. var.,
 from Ta¹⁸¹, 0.48 MeV level 3=6454
 γ-γ correl., mixing ratio δ, sign 3=12674
 γ-γ correlation, perturbed by hyperfine interaction in
 crystals 3=10245
 γ-quanta on H at 247 MeV 3=4371
 positron annihilation radiation 3=7835
 in water phantom 3=7063
 A⁴⁰, p-bombarded at 5.6 MeV, γ-γ, γ-p ang.
 correls. 3=6250
 Al²⁷(p,γ)Si²⁸ 992 keV resonance 3=12668
 Al²⁷, 2.21 MeV resonance radiation 3=22297
 Am^{241,243}, α-γ ang. correl., perturb. by environ-
 ment 3=4607
 Am²⁴³, γ-α ang. correl. rel. to mag. fld. 3=6211
 As⁷⁶, β-γ correlation 3=10289
 Au¹⁹⁶, γ-γ directional correl. 3=10274
 B¹¹(d, n_{γ154, 160V})C¹², n-γ correl. 3=24967
 B¹¹(d, n)C^{12*}(γ-n) ang. correl. 3=15226
 B¹² de-excitation after B¹¹(d, p)B¹² 3=4664
 Ba¹³³ decay, correl. 3=17440
 C¹²(d, pγ), p-γ ang. correls. 3=679
 C¹²(p, γ)N¹³ 3=12666
 C¹²(p, γ₀)N¹³ 3=12666
 C¹²(p, γ)N¹³, 1.5 to 2.0 MeV 3=17465
 C¹³(He³, αγ)C¹³, α-γ ang. correls. 3=2496
 Ca⁴⁷, β-γ-γ ang. correl., rel. to time
 reversal 3=10033
 Cd¹¹⁰, γ-cascades, directional correlations 3=15148
 Cd¹¹¹ decay in Ag dilute alloys, rel. to internal
 fields 3=22718
 Ce^{137, 137m, 138, 141, 143} 3=7969
 Ce¹⁴⁰, from decay of La¹⁴⁰, γ-γ ang. correls. 3=24868
 Ce¹⁴³, 293-56 keV cascade, ang. correls. 3=10297
 Ce¹⁴⁴, γ-γ ang. correl. 3=10296
 Cl³⁵(n, γ)Cl³⁶, γ-γ ang. correls. 3=6268
 Cm²⁴³, α-γ ang. correl. perturb. by environment 3=4607
 Co⁵⁶, γ-γ ang. correls. 3=649
 Cs¹³⁴ decay, correl. 3=17440
 Er¹⁶⁶, ang. correl. 3=17419
 Eu¹⁴⁵, γ-γ coincidences 3=8044
 Eu¹⁴⁸, directional correl. meas. 3=4596
 Eu¹⁵³, β-γ correl. 3=2412
 F¹⁸+p reactions, 483 - 597 keV 3=15193
 Fe⁵⁶, 1st excited state, γ-γ ang. correl. 3=17407
 Gd¹⁵³, rel. to K conversion electrons 3=17417
 Gd^{154, 156}, first 2⁺ state, ang. correl. in aq. soln. and molten
 chloride 3=628
 Gd¹⁵⁹ decay and Tb¹⁵⁹ levels, γ-γ, β-γ
 coincidences 3=22340
 Hf^{180m}, three cascades, γ-γ correl. 3=6179
 Ho¹⁶⁶, ang. correl. 3=17419
 Ho¹⁶⁶ decay, differential correl., 1380-81 keV cascade,
 statistical perturbation effects 3=22343
 In¹¹⁵, γ-γ correl. 3=7999
 K³⁹(p, γ)Ca⁴⁰ correl. and Ca⁴⁰ spin, 2, 3, 4th excited
 states 3=19776
 La¹⁴⁰, β-γ correl. 3=24904
 Li⁷(p, γ)Be⁸, 1.5-11 MeV 3=22378
 Li⁷(p, γ)Be⁸, 2.5 to 9 MeV 3=19845
 Lu¹⁷⁵ cascades, ang. correl. 3=15122
 Mg²⁶(p, γ)Al²⁷ 3=4567
 Mg²⁷ decay, from MgO + d, 9 MeV, coincidence, absence
 of 0.84-0.81 MeV or 0.84-1.01 MeV
 cascades 3=24892
 Mo⁹³(n, γ)Mo⁹⁴, γ-γ ang. correls. 3=6268

Gamma-rays—contd

- Mo⁹⁹, ang. correl. meas. 3=4591
 Na²³(p,γ)Mg²⁴, 300-800 keV, γ-γ ang. correls. 3=12670
 Nd¹⁴⁴, γ-γ polarization ang. correls. 3=12633
 Ne²⁰(d,nγ)Na²¹, n-γ ang. correls. 3=10377
 Ni⁶⁰(p, p'γ), 4.4 to 5.0 MeV 3=10343
 Ni⁶²(p, p'γ-γ) ang. correl. meas. 3=17408
 O¹⁶(t, pγ)O¹⁶, p-γ ang. correls. 3=10392
 O¹⁸(p, γ)F¹⁸, 1167 MeV 3=19843
 P³¹(p, γ)S³² 3=6242
 P³¹(p, γ)S³² 3=7989
 P³¹(p, γ)S³² and S³² levels, spin and parity 3=22377
 P³¹(p, γ)S³², 355 and 439 keV resonances 3=8090
 Pm¹⁴⁶, ^{148m}, γ-γ ang. correls. 3=15116
 Pr¹⁴⁴ ground state, β decay, β-γ directional correl., energy depend. 3=19753
 Pt¹⁸⁸, γ-γ coincidences 3=8053
 Pt¹⁸², de-excitation, e-γ ang. correls. 3=6181
 Rb⁸⁴, 1st-forbidden β-decays 3=22331
 Re¹⁸⁶, β-γ directional correl. 3=4600
 Re¹⁸⁷, γ-γ ang. correls. 3=22348
 Re¹⁸⁶, β-γ directional correl. 3=4601
 Rh¹⁰⁴, ang. correl. 3=15147
 Rh¹⁰⁸, γ-γ directional correls. 3=7997
 Sc⁴⁶, γ-γ, β-γ directional correls. 3=22328
 Si²⁸(p, γ)P³⁰ 3=6246
 Si²⁸(p, γ)P³⁰ at 6.847 MeV 3=2456
 Si³⁰(p, γ)P³¹, 1177 to 1509 keV 3=19774
 Sm¹⁵⁰, angular correlation, rel. to spin of 2nd level 3=24870
 Sm¹⁵², first 2⁺ state, ang. correl. in aq. soln. and molten chloride 3=628
 Sm¹⁵⁶ 3=17442
 Ta¹⁸², γ-γ correl. in ext. mag. field 3=8013
 Te¹²¹, γ-γ directional correl. 3=10293
 Tm¹⁶⁹ levels, coincidence, from Yb¹⁶⁹ decay 3=22346
 Tm¹⁷⁰, β-γ directional correl. 3=4600
 U²³⁵ fission 3=15242
 U²³⁵, fission, by slow n 3=12711
 V⁵¹, 320 keV state 3=7994
 W¹⁸² from Ta¹⁸² decay 3=4599
 Xe¹³¹, ang. correl. low energy cascades 3=651
 Zn^{64,66}(p, p'γ), 4.4 to 5.0 MeV 3=10343

detection, measurement

- See also Dosimetry; Gamma-ray spectrometers;
 Particle detectors; Radioactivity measurement.
 atomic bomb radiation by thermoluminescence 3=12611
 β-γ coincidence method, dead-time correction 3=4584
 bulk photoconductivity detectors 3=24677
 calorimeter, mercury thermometer 3=7820
 Cherenkov counters with lead-glass radiators, efficiency 3=24555
 difference meas. with multichannel spectrometers 3=2236
 dosimeter abs. calibration by calorimeter 3=574
 dosimeter, sensitivity, 15-300 MeV 3=5977
 dosimeter, using gas discharge counter 3=14945
 electron multiplier for 0.1-3 MeV 3=4373
 energy determ. by ext. conversion, effect of electron straggling 3=24676
 energy distrib. meas., scatt. in water 3=10076
 energy meas. using energy filter, efficiency 3=24678
 fission chamber, small, U coated W wire in Ar at 15 atm. 3=17098
 γ-radiation background, dose-rate 3=9055
 geophysical prospecting, computer analysis, U₂O₈ 3=21027
 high intensity, very small detector 3=17235
 internal source scintillation spectrometry 3=24547
 ionization chambers, Ra equivalents meas. 3=12367
 microcalorimetric meas. 3=10078
 mineral deposit, effect of nonuniform distrib. 3=2397
 Mössbauer spectra investig. apparatus 3=575
 neutron spectrometer, γ-rays discrim. 3=4412
 nuclei with A = 152-197, precision det. 3=8004
 parallel plate halogen counter 3=12370
 sample containers of Ti and Fe 3=19905
 scintillation detector efficiency, extended source 3=10006
 scintillation, technique 3=24682

Gamma-rays—contd

detection measurement—contd

- by semiconducting Si p-n junctions, prebreakdown microplasmas 3=14946
 sources, point and distributed, standardization 3=8021
 weak activity distrib. in thick medium 3=12431
 CaSO₄(Mn) thermoluminescence dosimeter for γ-det. 3=5978
 Li⁶ + Be⁹, α-γ coincidences 3=19157
 LiF, dosimetry, sensitization by impurities 3=11018
 NaI : Tl crystal, photofraction, 0.32-2.76 MeV 3=19604
 NaI: Tl crystals, mounting, improved resolving power 3=528
 NaI : Tl, intrinsic efficiency, photofraction 3=19605
 NaI: Tl nonlinear response effect on summing spectra 3=14944
 NaI : Tl on plastic phosphor, for fast coincidence with good resolution 3=19603
 Si junction counter, three types appl. 3=2167
effects
 See also Nuclear reactions, photons.
 acetyl-L-glutamic acid, e.s.r. 3=3164
 alkali halide crystals, stress/strain relationships 3=22649
 benzene, Cherenkov radiation obs. 3=2239
 biphenyls, hydrogen yield on γ-irradiation 3=3411
 Carnauba wax electrets, heterocharge reduction 3=13126
 coal, graphitized, absorption, rel. to applied pressure 3=20703
 crystals, directional depend. of defect number 3=20250
 dielectrics, elec. current, mechanism 3=4950
 diodes, thermionic, inert gas, neg. resist. effects 3=2026
 discharge, self-maintained, in ionization chambers 3=4038
 electron pair prod., absolute cross-sections for 8 metals 3=12655
 free radical yields, from DNA bases 3=22606
 glass, thermoelectricity 3=2983
 glycine, e.s.r., h.f.s. 3=18132
 guanidinium sulphate, ferroelec. parameters 3=17937
 n-hexane, liquid, electrical conductivity 3=11804
 ice, OH-radical stabilization 3=25150
 ionization chambers, pulse response 3=12368
 liquid scintillators, luminescent yield 3=9470
 mercaptosuccinic acid crystal, free radical formation 3=13304
 naphthalene, luminescence, yield rel. to impurity conc. 3=963
 nuclear excitation by compton-scattered γ-rays 3=24857
 paramagnetic resonance of free radicals in polymethacrylate, variation with γ-dose 3=25563
 photoelectric emission, from thin Ag and Bi layers, ang. distrib. 3=8204
 polymeric dielectrics, electrical conductivity, 25 MeV bremsstrahlung 3=20378
 π-meson photoprod. on protons, (γ, 3π) effect 3=2296
 π⁻ production ground 3=4424
 π⁺ photoprod. on He⁴ 3=4425
 π⁺ photoprod. from hydrogen, 187 MeV 3=7889
 π⁺, photoprod., 152-162 MeV 3=2299
 π⁺ production from p, at 160-200 MeV 3=4423
 polydimethyl-diphenyl and polydimethyl siloxanes, cross-linking 3=10563
 polyethylene, induced elec. conductivity 3=10874
 polyethylene, thermoluminescence, effect of oxygen 3=4995
 polyethylene, thermoluminescence meas. 3=4994
 polyformaldehyde, free radicals, e.s.r. 3=12858
 polymers, thermoluminescence meas. 3=4994
 ruby, thermoluminescence 3=23128
 secondary electrons, slowing down spectra 3=24345
 silica gel, H atoms formed 3=3419
 on small molecules at low temp. 3=12874
 Teflon, induced elec. conductivity 3=10874
 tetramethyl ammonium chloride, irradiated crystal, e.s.r. 3=8716
 triglycine sulphate, ferroelec. properties 3=20387
 triglycine sulphate, piezoelec. and elastic props. 3=17949

Gamma-rays—contd
effects—contd

- triglycine sulphate, rel. to dielec. props 3=25406
 water, Cherenkov radiation obs. 3=2239
 Al_2O_3 , α -phase, thermoluminescence 3=3072
 α - Al_2O_3 , thermoluminescence, high pressure effect 3=23129
 Bi₂Te₃, point defects 3=22712
 CdS, conductivity changes 3=2908
 CdSe, conductivity change 3=2908
 Ge crystal imperfections, effect of dislocations 3=20173
 Ge, ionization 3=15578
 Ge, n-type, isochronal and isothermal annealing 3=25313
 KCl, colour centre prodn. 3=22842
 KCl, hardening and F-band coloration 3=23359
 KCl, heavily irradi., F- and M- band absorption 3=816
 KCl, photoconduction and breakdown 3=23020
 KI:Ti, i.r. absorption spectrum 3=25449
 KNO_3 , NO_2 and NO_2^- e.s.r. 3=11116
 Li^+ ions, photoionization calc. 3=5621
 LiF, flow stress rel. to F-centres 3=2835
 LiF, i.r. absorption spectrum 3=25449
 LiF, thermoluminescence, impurity effects 3=11018
 $\text{LiN}_2\text{D}_2\text{SO}_4$, ferroelec., e.s.r. 3=13302
 $\text{LiN}_2\text{H}_2\text{SO}_4$, ferroelec., γ -irrad. 3=13302
 NaBrO_3 , thermal decomposition 3=6911
 NaCl , thermoluminescence, effect of 10^{-4} Ca 3=11017
 NaI:Ti , i.r. absorption spectrum 3=25449
 $\text{Na}_2\text{O} \cdot \text{B}_2\text{O}_3 \cdot \text{SiO}_2$ glass, colour centres 3=17795
 $\text{Na}_2\text{S}_2\text{O}_3$, e.s.r., effect of dehydration 3=23236
 $(\text{NH}_4)_2\text{HPO}_4$, paramag. π -electron radical 3=11117
 $(\text{NH}_4)_2\text{H}_2\text{P}_2\text{O}_8$, e.s.r. of defects 3=13022
 Ni—Zn ferrites, disaccommodation 3=11095
 PF_6 e.s.r. in NH_4PF_6 , second-order splitting 3=20652
 Si , carrier lifetime 3=22933
 Si , carrier lifetimes 3=15581
 Si , defects, annealing 3=22934
 Si , Hall coefficient, rel. to temp. 3=20316
 Si , ionization 3=15578
 Si oxide film, thermally oxidized, absorpt. 9μ , decrease 3=13189
 Si , P doped, temp., illum. depend., mechanism 3=25312
 Si p—n junction, thermally oxidized 3=4930
 Sn —organic cpds., Mössbauer spectra shape 3=17633
 Th^{232} , photofission at 6.61 MeV 3=24991
 U —Mo alloy, swelling 3=5135
 U^{238} , photofission at 6.61 MeV 3=24991
 XeF_4 , formation of XeF , e.s.r. studies 3=25136
 Zn , stress/strain curves 3=18174
 Zn , treated with Hg, dislocations and plasticity 3=20178
 $(\text{Zn,Cd})\text{S}$: Cu phosphors, crystal structure, atomic 3=23457
 ZnS , conductivity changes 3=2908
 ZnS , luminescence, effect of elec. field 3=8629
 ZnSe , conductivity changes 3=2908
 ZnTe , conductivity changes 3=2908

internal conversion

- even nuclei, $150 < A < 190$, first excited 2^+ states 3=8003
 K—LL Auger spectrum, empirical Z-depend. 3=2591
 K-shell coefficients at threshold 3=19803
 medium and heavy nuclei, isotope shift 3=6151
 from (n,γ) reactions, meas. apparatus 3=2245
 odd-A nuclei ($151 \leq A \leq 191$) 3=2380
 review of results 3=24879
 rotational transitions, E2 coeff. 3=4586
 spectrometer, for electrons, from (n,γ) reaction 3=7831
 theory for transitions of arb. multipolarity 3=22318
 $Z = 38-47$, K—LL Auger spectrum, in intermediate coupling region 3=2592
 Ag^{106} 3=17410
 Ag^{110m} decay to Cd^{110} 3=24898
 Au^{196} , E2 coeffs. of $2^+ \rightarrow 0^+$ transits. 3=656
 Ba^{133} decay by e capture, and Cs^{133} level spin 3=19820
 Ba^{134} , K coeffs. 3=17439
 Ba^{137} , internal Compton effect meas 3=2389
 Ba^{137} , M4 transition, intensity ratios 3=652
 Ce^{144} decay 3=8041
 Co^{57} , 14.4 keV 3=17431
 Co^{60m} , K conversion coeff. 3=17432
 $\text{Dy}^{192, 195, 197}$ decay 3=8047

Gamma-rays—contd**internal conversion—contd**

- Dy^{157} decay 3=22342
 Dy^{180} 3=4586
 $\text{Dy}^{185} \rightarrow \text{Ho}^{185}$, internal conversion coeffs. meas. 3=2245
 Er^{165} , electron spectrum, from Tm^{165} decay 3=10309
 Er^{166} , K coeff., E2 transition 3=12638
 Er^{166} , from Tm^{166} decay 3=8049
 Er^{166} , $2^+ \rightarrow 0^+$ pure E2 transitions 3=4598
 Er^{171} , beta-decay 3=22344
 Eu^{147} , electron spectrum above 1 MeV, from Gd^{147} decay 3=10300
 Eu^{149} 3=8045
 Eu^{149} , K coeffs., 461 and 272 keV γ 's 3=10301
 Eu^{156} decay 3=8041
 Fe , KLL Auger spectrum 3=24865
 Fe^{57} , 14.4 keV transition, K X-ray/ γ -ray ratio 3=19814
 Gd^{151} , electron spectrum in Tb^{151} decay, from Ta + p 3=10305
 Gd^{152} , 344 keV transition, rel. to K conversion electrons 3=17417
 Gd^{152} , $2^+ \rightarrow 0^+$ transition 3=2411
 Gd^{154} 3=4586
 Ge^{71} , isomeric decay 3=15134
 Ho^{165} 3=2415
 $\text{Hf}^{171, 173}$ 3=8050
 Hf^{177} 3=6178
 Hg^{179} , K coeff., E2 transition 3=12638
 Ho , beta-ray spectra 3=6208
 $\text{Ho}^{160} \rightarrow \text{Dy}^{160}$ decay, electron coincidences 3=15154
 Ho^{166} , 94 keV transition, penetration effects 3=6176
 $^{63}\text{I}^{135}$, K—LL Auger spectra, satellites 3=4707
 ^{131}I 3=10294
 ^{131}I , K and L lines 3=6171
 ^{132}I , electron spectrum 3=22335
 In^{114} , double, 192 keV transition 3=6170
 $\text{Lu}^{169} + \text{Lu}^{170}$, electron spectrum, 1020-3200 keV, from Ta + p 3=12641
 Lu^{172} , electron spectrum, 1020-3200 keV, from Ta + p 3=12641
 Lu^{175} , 114 keV transition, penetration effects 3=6176
 Lu^{176m} 3=8010
 Lu^{177} , 122 keV transition, $L_I + L_{II}/L_{III}$ 3=6178
 Nb^{90} , isomeric decay 3=15134
 Ne^{22} , 1277 keV transition, meas. of coeff. 3=8031
 O^{16} , from 6.052 MeV level 3=15140
 Os^{186} , K coeff., E2 transition 3=12638
 Os^{186} , $2^+ \rightarrow 0^+$ pure E2 transitions 3=4598
 Os^{188} , K. coeff., E2 transition 3=12638
 $\text{Os}^{191, 191m}$ 3=10312
 Pa^{233} , K-conversion coeff. 3=10318
 Pa^{234} 3=2395
 $\text{Pa}^{234}(\text{UX}_2)$, L, 63, 29 keV, coeffs 3=7998
 Pm^{141} , isomeric decay 3=15134
 $\text{Pm}^{148} \rightarrow \text{Sm}^{148}$ decay K/(L + M) ratio 3=19821
 Pt isotopes, neutron deficient 3=8053
 Pt isotopes, short-lived 3=8052
 Ra^{226} from Th^{230} decay 3=8056
 Re^{187} 3=8015
 Re^{187} , L conversion meas. 3=6180
 $\text{Re}^{186, 188}$, neutron capture, 30-350 keV 3=12696
 Rh^{104m} , 4.4 min. isomer, K conversion 3=4569
 Sm^{150} after neutron capture 3=10353
 Sm^{152} 3=4586
 Sm^{152} , $4^+ \rightarrow 2^+$ transition 3=2411
 Sm^{156} 3=17442
 Sn^{115} , 499 keV transition, K coeff. 3=10291
 Tb isotopes, n deficient, from Ta + p, 660 MeV 3=10302
 Tb^{152} , positron and conversion electron spectra 3=10304
 Tb^{163} , from Dy^{163} decay, conversion electron coincidences 3=17443
 Te^{121} , 214 keV transition 3=22306
 $^{99}\text{Te}^{135}$, K—LL Auger spectra, satellites 3=4707
 ^{1200}Ti 3=6210
 ^{1200}Ti , E2 coeffs. of $2^+ \rightarrow 0^+$ transits. 3=656
 ^{1203}Ti , 279 keV transition, K-conversion coeff. 3=12629
 Tm^{162} , β^+ spectrum 3=22345
 Tm^{169} levels, from Yb^{169} decay 3=22346
 Tm^{170} , E2 coeffs. of $2^+ \rightarrow 0^+$ transits. 3=656
 V , KLL Auger spectrum 3=24865

Gamma-rays — contd

internal conversion — contd

- W isotopes, short-lived 3=8052
 $\text{Xe}^{129,131}$, M4 transitions, intensity ratios 3=852
 Y^{88} , isomeric decay 3=15134
 Yb^{162} , β^+ spectrum 3=22345
 Yb^{170} , $2^+ \rightarrow 0^+$ pure E2 transitions 3=4598
 Yb^{171} 3=8007
 Yb^{172} , 78.7 keV 2^+ first excited state 3=8009
 Zr^{90m} , K conversion coeff. 3=17432

scattering

See also Compton effect.

- backscattering in scintillation spectrometer 3=14941
 build-up, heterogeneous media 3=24675
 by concrete, back-scatter, 0.664-1.25 MeV 3=10077
 crystals, on nuclei, resonance 3=20067
 γ -e, rel. to elementary nature 3=24673
 γ -quanta on H, elastic at 247 MeV 3=4371
 by K-electrons in mercury, 5.12 mc², Rayleigh
 scatt. 3=8213
 nuclear resonant scatt. of neutron-capture γ -rays,
 11 examples 3=6218
 on nuclei and nucleons, rel. to their polariz-
 ability 3=15170
 on nuclei, dispersion relations 3=8069
 on nuclei, inelastic, 20 MeV, rel. to shell
 structure 3=17449
 by nuclei in solid, resonance scatt. 3=8338
 by p, 500-850 MeV, 90°, and (1, 3) isobar 3=19601
 by protons, up to 300 MeV 3=2240
 solids, effect of external perturbation 3=15414
 in water, energy distrib. meas. 3=10076
 in water phantom 3=7063
 in water phantom, meas. and calc. 3=7062
 Al, Compton, and prod. of variable energy
 beam 3=14938
 Cd^{111} , photoactivation to isomer 3=15111
 Fe, ang. and energy distrib. 3=14936
 by Fe, multiple scatt. 3=12433
 Fe plate, Compton scattering, as monochromatic
 source 3=4369
 Fe^{56} , 0.845 MeV quanta 3=22303
 Fe^{57} , Mössbauer scatt. cross-section 3=2366
 H_2O , ang. and energy distrib. 3=14936
 In^{115} , photoactivation to isomer 3=15111
 Li, resonant scatt. for variable energy 3=4370
 Li^7 , meas. of mean lifetime of first excited state 3=4564
 Mg, resonant, ≤ 12 MeV, energy levels 3=6166
 Na^{23} , meas. of mean lifetime of first excited state 3=4564
 Sn^{116} , resonance scatt. 3=639
 Te^{125} , resonance (Mössbauer effect) 3=6145
 Tl^{203} , resonance fluorescence from 279 keV
 level 3=629

Garnets

See also Ferrites.

- diamagnetic, rare earth ion e.s.r. 3=15937
 ferro- and antiferromagnetism, Russian work,
 review 3=3092
 ferromagnetic, solid solution, saturation mag., effect of
 short range order 3=20616
 magnetic, indirect spin coupling, theory 3=5021
 preparation temp. reduction by Bi substitution 3=23191
 rare-earth ion ferrimagnetic properties, theory 3=13281
 rare-earth iron garnets, crystal chemistry 3=3282
 rare earth iron garnets, mag. moments of ions 3=6725
 rare earth Fe, exchange fields 3=1159
 rare-earth iron, Fe^{57} n.m.r. in hyperfine fields 3=3196
 rare-earth iron garnets, far i.r. spectra and ferrimag.
 resonance 3=8597
 structures and magnetic properties 3=15867
 DyFe garnet, hyperfine interact. of 2^+ state of
 Dy^{160} 3=1155
 DyFe garnet, Zeeman splitting, 85° and 300°K 3=994
 Er garnets, Faraday effects, i.r., rel. to ferromag and
 exchange resonances 3=918
 Eu garnets, Faraday effect i.r., rel. to ferromag. and
 exchange res. 3=918
 ErFe garnet, exchange resonance, far i.r. 3=1166
 Gd-ceric earth mixed, cryst. and mag. props. 3=3125

Garnets—contd

- Fe, rare-earth ion relaxation in ferrimag.
 resonance 3=1592
 $\text{Gd}_3\text{X}_5\text{O}_{12}$, ($\text{X} = \text{Al}^{3+}, \text{Ga}^{3+}$) paramag. susceptibility,
 20° to 1.5°K 3=1052
 GdFe , mag. structure at low temps. 3=3196
 Ho garnet, Faraday effect, i.r. rel. to ferromag and
 exchange resonances 3=918
 $\text{Ho}_3\text{X}_5\text{O}_{12}$ ($\text{X} = \text{Al}^{3+}, \text{Ga}^{3+}$) paramag. susceptibility,
 20° to 1.5°K 3=1052
 $\text{Tb}_3\text{X}_5\text{O}_{12}$, ($\text{X} = \text{Al}^{3+}, \text{Ga}^{3+}$) paramag. susceptibility,
 20° to 1.5°K 3=1052
 $\text{Tm}_3\text{X}_5\text{O}_{12}$ ($\text{X} = \text{Al}^{3+}, \text{Ga}^{3+}$) paramag. susceptibility,
 20° to 1.5°K 3=1052
 Y garnet, Faraday effect, i.r. rel. to ferromag and
 exchange resonances 3=918
 Y, gyromagnetic resonance, effect of method of
 prep. 3=8699
 YAl garnet, as acoustic transducer 3=25601
 Y—Eu, crystalline, mag. props. 3=3124
 YFe, ferromag. reson. mechanisms 3=3154
 YFe garnet, crystal structure, refinement 3=8834
 YFe garnet, degenerate spin-wave instabilities,
 suppression 3=1164
 YFe garnet, exchange resonance, for i.r. 3=1166
 YFe garnet, ferro-acoustic resonance 3=11129
 YFe garnet, ferromag. relaxation, intrinsic &
 uniform precession 3=1163
 YFe garnet, ferromagnetic resonance rel. to induced
 anisotropy 3=8702
 YFe garnet, ferromagnetic resonance, rel. to r.f.
 magnetic field 3=8701
 YFe garnet, hyperfine Zeeman splitting 85° and
 300°K 3=994
 YFe garnet, mag. effects of In and Ga
 substitutions 3=1048
 YFe garnet, Nd-substituted, ferrimagnetic
 properties 3=25546
 YFe garnet, rare earth doped, anisotropy,
 4°2' to 1.5°K 3=1049
 YFe garnet, rare earth doped, ferrimag. res.
 line widths 3=1174
 YFe garnet, Nd and La substituted, absolute saturation
 magnetization and remanence 3=1047
 YFe garnets, magnetization and resonance props. 3=6721
 YFe garnets, spin wave linewidth, rel. to subsidiary
 resonance suppression 3=18119
 YFe, n.m.r. freq., anisotropy 3=3205
 YFe, substitution of Mn^{2+} , Fe^{2+} and Ni^{2+} 3=3129
 $\text{Y}_2\text{Fe}_3\text{O}_{12}$, crystal growth 3=20801
 YGa garnet, as acoustic transducer 3=25601
 $\text{Y}_2\text{In}_x\text{Fe}_{2-x}\text{O}_{12}$, ($x < 0.5$), preparation and ferrimag.
 resonance 3=20800

Gas analysis

See Chemical analysis.

Gas-discharge tubes

See also Counters; Ion sources.

- corona stabilizer tube with regulated voltage 3=9747
 electrode erosion by electrons, theory 3=9746
 glow, pulse sputtering of cathode 3=24243
 glow tube, impedance—pressure characteristics 3=4061
 glow, impedance meas., 300 c/s to 5 Mc/s 3=4054
 glow, Ne reference rel. to Ar, Kr, Xe admixtures 3=4054
 hollow-cathode, demountable, design and
 construction 3=7469
 hot-cathode, microwave switching, starting levels 3=7490
 light-pulse generator, nsec 3=18977
 particle track visualization 3=2182
 plasmoid sources, conical 3=14567
 thyatron, crossed-field, cold-cathode 3=7455
 D, higher intensity than H 3=24232
 H_2 , Townsend parameters, rel. to cathodic surf.
 layers 3=4033
 Ne, light source, line, ang. distrib. 3=16757
 Xe, for masers, optical, ruby, design 3=19217
 Xe, XF3000, radial temp. and mobility 3=19192

Gases

See also Kinetic theory, gases.

- absorption, acoustic waves, imperfect gas, classical
 calc. 3=18856
 acetone vapour, apparatus for qualitative studies 3=19071

Gases — contd

- aerosols, thermophoresis of large solid particles, theory 3=7230
- bimolecular collisions, rel. to viscosity, sound velocity and spectral line breadth 3=16660
- binary systems, diffusion coeff. determ. from viscosity 3=7231
- charged particle motion in alternating fields 3=387
- compressibility factors, derivative, two new 3=11826
- corresponding states law 3=21433
- dense, hole theory 3=18800
- diatomic, vibrational relax. in dissociation 3=15388
- diffusion in polyethylene terephthalate 3=11306
- dissociating, moment eqns. for vibrational relaxation 3=8306
- dissociating, turbulent boundary layer 3=3819
- electric birefringence for non-rigid molecules. 3=174
- electric strength, Ar-Ne mixtures, for pulsed microwave field 3=5647
- electric precipitation, dust space charge 3=24202
- electron conductivity, rel. to velocity depend. of collision freq. 3=14763
- electro-optical effects, in critical region 3=21371
- energy exchange between gases at different temp. 3=1725
- equations of state, virial coeffs., temp. extrapolation 3=7234
- films, "wedge pressure" 3=1723
- flow from compression in a reservoir, press. temp. relations 3=7224
- fully ionized, elec. resistivity 3=9811
- heat transfer, by Monte Carlo method 3=1730
- high-temp. thermodynamic props. of monatomic gas 3=18855
- hot W surface in, energy exchange 3=24078
- hypersonic flow, viscous heat-conducting gases. 3=160
- inert gases, electron distrib. functions, transport coeffs. 3=5628
- intramolecular oscillations, thermal relaxation 3=22609
- ionization potential meas., electron energy 3=9719
- ionized, collision phenomena, review 3=12078
- irreversible processes, statistical mechanics 3=3827
- irreversible processes, statistical mechanics 3=11710
- Kerr effect in multicomponent systems 3=7249
- lattice gas, two-dimensional, statistics 3=66-7
- light scatt., nonlinear, in elec. or mag. field 3=11834
- light scatt., in inhomogeneous elec. field, intensity eqn. 3=23931
- liquified, temp. variation of u.s. vel. and adiabatic compressibility 3=7204
- masers, optical, review 3=7730
- masers, threshold conditions at h.f. 3=7731
- moisture meas., when in two phases 3=7252
- molecular gases, 2nd virial coeff., effect of quadrupole moments 3=21436
- monatomic, shock wave smoothing-out, asymptotic law 3=5488
- multicharged ions, electron loss 3=7448
- nuclear relax. rel. to intermol. mech. 3=14222
- photoelectric currents, theory 3=7250
- photon scatt. by gas molecules 3=7245
- quantum gas, evolution eqn. soln. 3=9365
- radioactivity meas., using gas-flow chambers 3=4583
- Raman spectra, broadening by intermol. forces 3=9508
- real, theory, book 3=11816
- relativistic, ideal, current vector and mass tensor 3=70
- shock wave propagation in a heat-conducting gas 3=18899
- solution in polyethylene terephthalate 3=11305
- spectra, i.r. bands, integr. intensity and line widths, meas. method 3=7248
- spectral transparency, population shift theory 3=16662
- spherical model, one-dim. phase transition 3=16554
- streams, elec. cond. meas. 3=24156
- Tonk's gas, generalized, partition function 3=16550
- transport phenomena, statistical mechanics 3=9497
- turbulence, heat exchange and frictional resistance 3=9490
- in uniform force field, effect on concn. 3=7238

Gases—contd

- vibrational relaxation, shock-tube study 3=7243
- weakly-ionized, elec. cond. in mag. fld. 3=7251
- CO₂, effect of H₂ and D₂ on relaxation time 3=16658
- CO₂, ν_3 , 4.3 μ absorption, 1200° to 2400°K 3=1731
- CO₂-H₂O system, in turbulent motion, mass transfer concn. effect 3=16152
- He, collision excitation of atoms to 4¹D 3=2580
- Li⁷⁺ ion interference patterns 3=21901

Geiger counters

See Counters, Geiger.

Gelatin

No entries this year

Gels

- diffusion theory 3=9377
- formed by polyvinyl alcohol and Cu⁺⁺ salt reaction, concentrated solutions 3=16163
- polymer, resulting from cross-linking and scission 3=17625
- silica, γ -irrad., H atoms formed, e.s.r. study 3=3419
- vinyl polymer, irradiated, mol. wt. changes 3=17626
- CuO-Fe₂O₃, ferrimag. props. 3=18104
- Na carboxymethyl cellulose, diffusion of water 3=1403
- Si-base, high-temp. stability 3=21010

Geochemistry

See Earth, composition.

Geochronology

See Earth, age; Radioactive dating.

Geodesy

See also Gravity.

- datum shifts, from satellite camera obs. 3=11375
- hydrodynamic earth model 3=16188
- lines, infinite number on surface, using focusing field 3=11745
- telescope, achromatism 3=14328

Geoelectricity

See Earth, electricity.

Geomagnetism

See Earth, magnetic field.

Geometrical optics

See Optics, geometrical.

Geometry

- non-Riemannian space, differential invariants, correction 3=5319

Geophysical prospecting

- anomalous subsurface mass det. from grav. anomaly 3=5180
- book, applied geophysics 3=3424
- conductivity electrical, meas., four-point resolving power 3=21024
- dipole, vertical mag., above earth's surface, e.m. field 3=19439
- disk electrode in borehole, electric field 3=24203
- electrical, constant-current, theory 3=3436
- γ -ray logging and sampling 3=23576
- geophone arrays, Chebyshev optimized 3=16192
- induction logging, field calc. for oscill. dipole in cylindrical interface d medium 3=19417
- minerals, radioscopic detection, diffraction effects 3=18489
- oil, radioactive logging detector 3=21028
- radioactive, γ -ray log, computer analysis for U₃O₈ 3=21027
- rocks, dynamic elastic parameters meas. 3=3427
- techniques, review 3=1409
- Ra, Th and K, aircraft det. using NaI : Tl probe 3=5185

Geophysics

See also Atmosphere; Earth; Oceanography; Seismology.

- albedo, rel. to atmospheric turbidity 3=6961
- coal mines, hammer blow signals, range 3=14284
- consequences of decrease of gravitation const. 3=5177
- consequences of steadily decreasing gravitation 3=5234
- containers, for tests at great sea depths 3=3443
- continental drift and mantle convection current harmonics 3=9009
- Hawaiian islands, origin 3=18480
- heat flux meters 3=9635
- measurements, with integrating devices, actual field variations 3=18488
- uses of micropulsations ($\lambda \approx 10^9$ - 10^{10} m), review 3=485

Geophysics — contd

- orbiting observations 3=5176
- rock cracks, rel. to brittle fracture theory 3=23363
- sand ripples in the desert 3=1421
- silicates, melting relations rel. to pressure 3=9657
- effects of solar flares in IGY and IGC 3=11475
- synthesis of geomorphology, oceanology, luminology and geo-ecology 3=11373
- tektites, cosmic-ray exposure history, rel. to origin 3=1515
- tektites, parent body origin hypothesis 3=3562
- underground cavities, intense shock effects 3=16194

Germanium

See also Semiconducting devices; Semiconducting materials, germanium.

- absorption spectrum near fund. edge 3=10954
- adsorption and desorption on W, field emission 3=8928
- adsorption of O₂, kinetics and mechanism 3=3365
- adsorption of water on n-type powder 3=6890
- alloying, thermal, dislocation influences 3=20901
- anisotropic solution, light figures study 3=13410
- atom of Ge⁷¹, h.f.s. and g-factor 3=17390
- atomic heat, 12=273°K 3=12928
- ion beam from h.f. source 3=24380
- bremsstrahlung spectrum, isochromat structure 3=8611
- chemical reaction with I₂, etching, mechanism and patterns 3=13601
- cleaved surfaces, structural props. 3=23383
- cleaved surfaces, tear marks 3=23382
- compression and effect of annealing on dislocations 3=6516
- crystal defects, surface, recomb. with adsorpt. of polar liquid mols. 3=22709
- crystal dendritic strips, electrical props., dislocations effect of growth conditions 3=18282
- crystal dislocation, electron microscope exam. 3=22784
- crystal dislocations and X-rays, anomalous transmission 3=20947
- crystal electron capture by deep impurity centres, negative temp. var. 3=23017
- crystal, electron diffraction pattern, unknown streak 3=1287
- crystal growth, constitutional supercooling 3=13415
- crystal growth dendritic strips 3=18282
- crystal growth, double-crucible method 3=13418
- crystal growth, epitaxial, iodide method, temp. 3=23417
- crystal growth, facet formation 3=6823
- crystal growth, highly doped, As 3=20792
- crystal nucleation sites, step heights, cleaved, by replica 3=20172
- crystal spheres, sputtering by Kr ions, 1 to 10 keV 3=2051
- crystals, dislocation and crack formation 3=20758
- crystal striations, and growth, etching and elec. obs. 3=22786
- crystal structure and anomalous X-ray transmission 3=18307
- crystal structure, conductivity electrical, minority lifetime, dendrite strips 3=18281
- crystal surface states, cathode in 2 mol HCl electrolyte 3=17689
- crystals, dislocations, velocity, as a function of stress 3=6519
- crystals, etching near dislocations, temp depend. 3=17756
- crystals imperfections, γ induced, effect of dislocations 3=20173
- defects, production and alteration, rel. to electron irradiation 3=22724
- defects, study by precipitation techniques 3=22703
- dendritic crystal growth, mechanism 3=13421
- diffusion and solubility of Te 3=2825
- diffusion in, of impurities, mechanism 3=20222
- diffusion profile, in etching, meas., from corrosion pot., n-type 3=20228
- diffusion of Sb, surface, 250-650° C 3=20223
- dislocation mobility 3=23288
- dislocation mobility, etch-pit meas. 3=17729
- dislocations and nucleation of oxidation 3=25276
- dislocation arrays due to deformation 3=10669
- dislocation cores, structure theory 3=2793
- dislocation density, rel. to anomalous X-ray transmission 3=20196
- dislocation distrib. rel. to deformation. 3=15490
- dislocations in single crystals, X-ray obs. 3=6526

Germanium — contd

- dislocations, in torsional deformation, by electron microscopy 3=6514
- dislocation velocities and densities, erratum 3=10660
- domain formation, rel. to deformation and annealing 3=17772
- elastic constants, effect of holes, calc. 3=20689
- elastic constants, 0-30 000 lb/in² and -195.8 to 25° C 3=11133
- elastocaloric effect, calc. 3=4832
- electron emission, "hot" electrons 3=2017
- electron emission, hot, in elec. field 3=24331
- electron emission, secondary, energy distrib. 3=2023
- electron energy losses in very thin films 3=20154
- electron scatt. at cleavage surfaces 3=4857
- electropolishing technique 3=23501
- epitaxial films, evaluation 3=2889
- epitaxial films, structure rel. to formation 3=3280
- epitaxial layers, rel. to twin formation 3=1256
- etching, anodic, special effects 3=16027
- etching, anodic 3=16028
- etching in H₂O₂, effect on elec. props. 3=2899
- etching, with KI-I₂ redox system 3=8440
- excess-carrier lifetime, temp. depend. plateaux, p-type, Ni-doped 3=17847
- Faraday rotation, 0-120 kG, interband 3=25441
- field-effect modulation of light 3=15572
- films, characteristic energy loss of 50 keV electrons 3=14661
- films, epitaxial formation conditions 3=18284
- films, epitaxial, surface roughness 3=25771
- films, epitaxially deposited on CaF₂, physical and elec. props. 3=23416
- films, growth 3=23398
- films, H catalysis and adsorption 3=3397
- films, on metals, prep. and props. 3=11317
- films, optical density meas. 3=20934
- films, polycrystalline, electrical properties and flicker effect 3=15540
- films, resistance, electrical, acceptor levels, work function, ultra-high vacuum 3=20309
- films, surface patterns, triangular 3=20925
- films, 12-60 m μ , reflectivity and transmission, wavelengths 0.4-0.7 μ 3=10953
- films, vacuum deposition on Ge 3=23399
- foil, prod. for nuclear work 3=19501
- forbidden bandwidth, carrier density depend, from diode recombination radiation shift 3=20539
- forbidden 222 electron reflection 3=23440
- fracture strength, -196° to 500° C 3=23351
- fusion curve at high pressures 3=14417
- γ -irradiated, annealing stages, in n-type 3=25313
- Ga-doped, crystal growth from melt 3=13414
- growth mechanism of dendrites 3=25678
- growth on GaAs, Ge crystal surfaces 3=20806
- Grüneisen γ , temp. depend. calc. 3=10607
- hole effective masses, calc. 3=17864
- hole mobility, temp. depend., discrepancy 3=17863
- impurity nucleus, dynamics and γ -ray cross-section 3=20063
- i.r. absorption spectra of n and p crystals 3=935
- i.r. emittance rel. to absorption processes, 323° to 473° K 3=10961
- junction, p-n, plastically deformed, negative resistance and double injection 3=8534
- K-absorpt. spectrum, fine structure and theory 3=6659
- lattice absorption i.r. bands, shell model applic. 3=10927
- lattice absorption of light 3=928
- lattice vibrations, normal modes, θ -series calc. 3=4809
- lattice vibrations and interatomic forces 3=8349
- layers, epitaxial growth 3=18283
- liquid, density rel. to temp., and m. pt. 3=3793
- liquid, reflection spectra analysis 3=14167
- magnetic props., var. with doping, antiferromag. transformation 3=23135
- magnetoresistance, degenerate n-type, calc. 3=20314
- magnetoresistance, heavily doped, 1.6-4.2° K 3=22929
- magnetoresistance, negative, 1.7-290° K, n-type, strongly doped with Sb 3=20302
- molten, elec. resist. and Hall effect 3=9475
- MoO₃ fission fragment damage 3=22855

Germanium—contd

- neutron damage, direct observation 3=6553
- neutron monochromator 3=23428
- melt, diffusion of impurities 3=18804-5
- n-type, Faraday effect 3=4964
- optical films, preparation and properties 3=9603
- optical consts., extreme u.v. 3=20436
- optical props. of compensated heavily doped Ge 3=2988
- optical reflectance for 1.5-25 eV photons 3=8584
- phonon propag., microwave, rel. to doping 3=4811
- P-doped, e.s.r., rel. to stress 3=18131
- photoconductivity, and capture by deep impurity centres, negative, temp. var., n 3=23017
- photoconductivity, Cu-doped material, rel. to carrier capture 3=17859
- photoconductivity, rel. to deep radiation defects prod. by 1 MeV e's 3=20409
- photoconductivity, electric field quenching, 1.8-2.5 μ , freq. depend. 3=17959
- photoconductivity, negative, in mag. fields > 10 kOe 3=17958
- photodiode current, mag. field effects 3=20408
- photoelectric emission, electron beam effects 3=19314
- photoelectric emission, by X-rays, 0.28-9 keV, on films, effective depth 3=21864
- photomagnetic e.m.f., time and thickness depend. 3=17966
- piezoresistance, review 3=2965
- plastic deformation, at and below room temp. 3=11155
- plastic deformation 550° to 780°C, in N₂ atmosphere 3=18186
- platelets, twinned, vapour growth 3=20781
- radiation damage, voltage annealing in tunnel diodes 3=10860
- radiative carrier recombination at dislocations 3=17860
- recomb., at Ni, 80-250°K 3=6580
- recombination radiation shift on pulse current injection, in diode 3=20539
- reflectivity and transmission, vacuum u.v., δ to 30 eV 3=13145
- reflectivity spectra, visible and u.v., fine structure and temperature dep. 3=10909
- reflectivity spectrum fine structure in near u.v. 3=4961
- reflectivity, var. with wavelength, and electron effective mass, As-doped 3=22930
- semiconducting drift mobility, p-type, independence of electric field at 77°K 3=20301
- semiconducting electron effective mass, As-doped 3=22930
- semiconducting, electron mobility, temp. var. up to 1000°K, Sb-doped 3=20303
- semiconducting, excess-carrier lifetime, depend. on majority density, highly doped 3=17848
- semiconductor devices, tunnel diodes, alloyed contacts of Au, low resistance 3=20360
- slip, single without cracks, etching obs. 3=22792
- solubility of impurities, maximum, and m.p. distrib. coeff. 3=20910
- sputtered surfaces, hillocks 3=24386
- sputtering, deposit patterns 3=22877
- sputtering, using 1-5 keV Ar⁺ ions 3=9877
- stacking-fault energy 3=17765
- structure changes at high press. 3=11210
- structure of clean (100) and (111) surfaces 3=13554
- surfaces, abraded, dislocation cracks 3=12981
- surface energy, cleavage meas. 3=25177
- surfaces, for epitaxial devices substrates 3=6880
- surface levels, optical study 3=2989
- surface reactions with O and I 3=13555
- surface structure, cleaved (111) 3=11312
- thermal conductivity, p- and n-type 3=2741
- thermal conductivity, rel. to fast neutrons 3=17674
- thermal conductivity, 300°-1200°K 3=10611
- thermal expansion anomalous negative low-temp. values 3=10603
- thermal expansion, α - > 42°K 3=15443
- thermoelectricity, temp. and carrier density var. 3=20426
- thermo-e.m.f. of heavily alloyed Ge 3=15631
- thin film, absorption and reflectivity, u.v. 3=2995
- thin film on Ge base, refractive index, small difference, meas. 3=24007

Germanium—contd

- u.s. pulse propagation, 62 Mc/s 3=10592
- vacancies, lattice, formation energy calc. 3=6511
- vacancies, quenched-in 3=22750
- vacancies, strains and mech. relax. 3=22754
- wafers, slip and Lomer-Cottrell barriers 3=10679
- X-ray atomic scatt. factor, imag. part 3=11257
- X-ray diffr., asymm. Bragg case 3=5098
- X-ray, K-absorption, extended line structure, rel. to polarization 3=20500
- X-ray reflection from dislocations, intensity 3=5063
- X-ray reflection, dynamical theory 3=10972
- X-ray reflection props. 3=1318
- X-rays, anomalous transmission and dislocations 3=20947
- X-ray spectrum short wave limit 3=4919
- X-ray transmission, anomalous 3=5099
- X-ray transmission, anomalous, deform. effects 3=20197
- X-ray transmission, Cu K α , anomalous, var. with doping 3=10975

Germanium compounds

- alloys, superconductivity 3=16873
- Ge- α -Fe solid solution X-ray, metallographic, micro-hardness, and magnetic meas. 3=3340
- Ge-Al-Sb crystallization, equilibrium, heterogeneous, Al-Sb interaction 3=20902
- GeCl₄, force consts. from vibr. data 3=6376
- GeCl₄, valence force fields calc. 3=17551
- GeDCl₃, valence force fields calc. 3=17551
- Ge₂H₆ and Ge₂D₆, vibrational spectra 3=2627
- GeHCl₃, valence force fields calc. 3=17551
- GeH₃PH₃' and GeH₃AsH₃', proton resonance 3=12863
- Ge-Li alloys, Li precipitation rel. to defects 3=22703
- Ge₃Li₂CoO₈ spinel, crystal structure 3=5112
- Ge₃Li₂ZnO₈ spinel, crystal structure 3=5112
- Ge-Ni solid solutions, supersat., decomposition, X-ray study 3=23486
- GeO₂, ads. of cations, anions, in dilute solns. 3=13608
- GeO₂, liquid and solid, diffusion of O²⁺ 3=20224
- GeO₂, transformation kinetics, 800°-1200°C 3=13400
- GeRhLiO₄ spinel crystal structure 3=13479
- GeS, absorption and photocond. spectra 3=2990
- Ge-Si, disordered, lattice thermal cond. 3=25207
- GeS₂, absorption spectrum 3=2990
- Ge-Si alloys, thermal conductivity at high temps. 3=10616
- Ge-Si, band structure calc. 3=22682
- Ge-Si, lattice vibration spectra 3=12913
- Ge-Si system, heterodiffusion, electron-diffraction study 3=22808
- Ge-Si, valence band structure 3=12946
- GeTe, carrier compensation for various solutes 3=25365
- GeTe, vapour pressure, 683°-837°K 3=295
- GeTe-SnTe, rhombohedral-cubic transition 3=13524
- Ge-ZnS films, i.r. transmission curves 3=10952

Glaciers

- energy interchange, extinction effects and porosity. 3=25861

Glass

- See also Optical materials; Vitreous state.
- aluminoborosilicate glasses, containing Fe, effect of Na₂O on elec. cond. 3=22936
- anelasticity, viscoelasticity, exptl. review 3=13334
- aromatic molecular matrix, stimulated phosphorescence rel. to laser action 3=2610
- borate, alkali, B n.m.r., var. composition 3=18147
- borosilicate, granular structure, by electron microscopy 3=13545
- breakage by sonic booms 3=16692
- charged-particle damage tracks 3=22850
- commercial glasses, breaking strengths 3=11175
- conductivity, electrical, alkali free magnesia-lime, effect of Al₂O₃ 3=17880
- conductivity, electronic, in irradi. glass 3=10870
- crack growth and fracture 3=3243
- cracks, brittle growth, rel. to compression 3=23363
- cracks, propagation velocity 3=13380
- dielectric losses, 8 mm. 20-400°C 3=20373
- dielec. meas., non-polarizing electrodes 3=19129
- as dielectric standard for microwave frequency 3=13103
- elastic constants, optical glasses, temp. var. 3=5058

Glass—contd

- elasticity, review 3=6770
 electrical cond. 3=20372
 electron emission, secondary, images 3=9845
 e.p.r. of W^{5+} , silicate and phosphate 3=20658
 ethanol, Nb^{4+} ions, e.s.r. 3=15946
 fibre, use in point target autocollimator 3=11898
 fibres embedded in plastics, strength, review 3=1209
 flaw characteristics, ionic substitution effects 3=22768
 formation and liquid structures 3=9443
 glassy polyphosphates, Raman spectra and structure 3=15965
 internal friction, -100 to +450°C, various compositions correction 3=15979
 irradi. by Co^{60} source, thermoelectricity 3=2983
 light scattering, anomalous, particles model 3=9624
 luminescence, Cr-activ., temp. depend. 3=25483
 maser, optical, Nd^{3+} , 9180 Å, 80°K 3=12339
 micropore growth, rel. to stress and environment 3=18365
 multidimensional transition in polymeric materials 3=25766
 oxide glasses, i.r. dispersion 3=20439
 oxygen outgassing, by electron bombardment 3=16124
 permeation of He gas 3=2826
 phosphate, two and three-component, Raman spectra 3=8602
 photosensitive, colouring by X-irrad. 3=8478
 plasticity, review 3=6770
 polishing, mechanism 3=18373
 proton mag. spin relaxation 3=23250
 Pyrex, elastic const. meas. 3=9527
 quartz, diffusion of O 3=2831
 radiation effects, conference, Rochester (1962) 3=6549
 reflectivity, rel. to irradiation 3=8585
 rigid-glass soln., stimulated emission 3=959
 rigid solution, i.r. stimulated emission, lifetime 3=10989
 scintillators for neutron detect. 3=2277
 semiconducting, crystallite detection by electrical conductivity 3=8921
 semiconductor, Fermi states, calc. 3=20918
 silica, high-pressure densification, effects of shear 3=8919
 silicate glasses, Zr^{4+} e.s.r., 450-9320 Mc/s, 77°-295°K 3=20660
 silicate, i.r. spectra, 4.2° to 773°K 3=3019
 silicate, laser action of Nd and Yb ions, simultaneous 3=7737
 silicate, structure from transport measurements 3=1362
 sitals of cordierite system, u.h.f. dielec. props. 3=25393
 soda silicate, thermal expansion and structure 3=22668
 soda-lime, surface lines, rel. to etching 3=18375
 stress analysis, dynamic problems, conference 3=13342
 stresses, residual, in quenched glass 3=15984
 structure, direct electron microscope study 3=3348
 surface attack by ionic bombardment 3=17810
 surfaces, etched, defects development 3=11314
 thermoluminescence, meas., heating apparatus 3=6685
 (33.3%) Na_2O-SiO_2 , ordered rel. to disordered phases 3=11303
 titaniferous, coord. state, spectral data, 3=25459
 toughening by heating and cooling, rel. to thickness 3=3229
 toughening, by quenching and HF etching 3=16004
 transformation, liquid → glass 3=12003
 ultrasonic vels. meas., high temps. 3=7294
 water, adsorbed, dielectric behaviour, v.l.f. 3=17950
 X-ray reflection, ultrasoft 3=14706
 X-ray reflection, 1.54 Å, BK7 3=23093
 Ag-containing, photographic process 3=24066
 As_2Se_3 -type, far i.r. spectra 3=10930-1
 B_2O_3 , i.r. spectra 3=13174
 Ba borate glasses, X-ray study 3=11269
 Ba borosilicate, radial distrib. study 3=13483
 Bi borate, dielectric const. and d.c. resistivity rel. to temp. 3=891
 Cr^{3+} e.s.r. 280-9320 Mc/s, 77°-295°K 3=18129
 Gd^{3+} , e.p.r. 3=20651
 Li-Mg-Al- SiO_3 , rare-earth activated, stimulated emission 3=7736
 Li-Mg- SO_3 , Gd^{3+} -activated, u.v. stimulated radiation 3=3042
 Mn^{2+} , e.p.r. 3=20651
 Na borates, i.r. spectra 3=13174
 Na borate, u.v. absorpt., composition and temp. effects 3=13173

Glass—contd

- Na borate, structure of solid and liquid 3=1361
 Na silicate, u.v. absorpt., composition and temp. effects 3=13173
 $Na_2O-Al_2O_3-SiO_2$ electrodes cation sensitivity and durability meas. 3=3401
 $Na_2O-B_2O_3-SiO_2$ electrodes cation sensitivity 3=3401
 $Na_2O.B_2O_3.SiO_2$, ionizing radiation effects 3=17795
 Nd-activated, as optical quantum generator, flash spectrum time variation 3=25444
 Pb silicate, elec. cond. rel. to "water" content 3=2945
 $PbO-B_2O_3$ glasses, structure, by n.m.r. 3=18148
 SiO_2 glass, elastic moduli and u.s. attenuation, effect of fast-neutron irradi. 3=13330
 SiO_2 , specific heat, low-temp. excess rel. to structural defects 3=767
 Ti^{3+} e.s.r. in glasses, rel. to structure 3=3179
 $TlAsSe_3$, photocond. and other props., effect of I and Ge 3=15635

Glass—metal seals

- demountable seats and heat-resist. valves 3=14230
 electrochemical test for distinguishing between W, Mo and NiCoFe 3=9311
 pressure-tight, simple 3=11646

Gold

- adsorption on Mo surfaces, 2×10^{-8} torr 3=5149
 annealing, aggregate vacancy processes 3=4864
 annealing spectrum after electron irradi., analysis 3=2846
 atom, elastic electron scatt., 150-1900 eV 3=12779
 atoms, sputtered, by Kr^+ , 10-1000 eV, energy, by calorimetry 3=5724
 blocking contacts, to CdS, at high impressed fields 3=22968
 Bordoni peaks, rel. to deformation and annealing 3=23298
 colloidal micro-crystal, electron diffraction, squamous contrast 3=1316
 crystal stacking fault growth mechanism 3=20203
 crystal vacancy clusters, effect of quenching and impurities 3=20162
 de Haas-van Alphen effect, 4.2°K, 100,000 G 3=23138
 deuteron irradi., low-temp., annealing 3=13021
 diffusion of Ag, surface 3=20232
 diffusion in Cu, grain boundary, meas. 3=2824
 diffusion of Fe, Co and Ni, meas. 3=8449
 diffusion of Pb, Sn and Cu in single crystals 3=4888
 diffusion and solid solubility in $BiTe_3$ 3=17781
 diffusion in Zn, anisotropic 3=17793
 dislocation prod. by low-energy ions 3=17723
 dislocation relaxation peaks 3=25613
 displacement cross-section calc. for electrons 3=15523
 elastic aftereffect, activation energy and volume 3=11140
 elastic constants, -183° to 300°C 3=20688
 elec. resistivity, effect of plastic strains 3=13036
 electron diffraction, advantages of 1200 kV beam 3=20951
 electron diffraction, lecture demonstration 3=4201
 electron diffraction by reflection, rel. to surface 3=18403
 electron energy loss by bremsstrahlung at 1 MeV 3=17699
 electron scatt. by films, background intensity 3=4202
 electron scattering, double Mott, 45-245 keV 3=24924
 "electron wind" effect 3=22829
 emissivity, 4-13 μ, 550°-1000°K meas. 3=292
 epitaxial film, similarity with Ag, Cu 3=23506
 etching of annealing-twin boundaries 3=16029
 fatigue investigation 3=18213
 Fermi surface, dimensions 3=6495
 film on Ag, Pd, Ni, structure 3=1371
 film, electron diffraction spot pattern intensity meas. 3=1283
 films, cond. electrons m.f.p., scatt. parameter 3=15546
 films, conductivity and supercond critical temp. rel. to electrostatic charging 3=15545
 films, damage by inert gas ions 3=10707
 films, deposited on water surface 3=25774
 films, doped, clusters of point defects 3=25270
 films, elec. resistance, temp. var., rel. to thickness 3=15544
 films, electrical conductivity, rel. to various supports 3=15542

Gold — contd

- films, electrical resistivity 3=15543
 films, electron diffraction intensities rel. to tilting and λH 3=1295
 films, evap. on C, growth and structure 3=1375
 films, fission-fragment damage 3=22864
 films, granular, electrical properties and flicker effect 3=15540
 films, interstitial damage, rel. to Ar ion bombardment 3=17712
 films, optical constants 3=13147
 films, optical consts. rel. to wavelength 3=10902
 films, optical density meas. 3=20934
 films, optical transmission phase-shifts meas. 3=14361
 films, photoelec. emission rel. to thickness 3=425
 films on p-type GaP, photoelec. positive hole range 3=908
 films, on silver-coated mica, double-positioning structure 3=1376
 films, single-crystal, prep. method 3=1367
 films, sorption of H, CO, surface potential, diode meas. 3=13602
 films, transverse electric field effects 3=15541
 films, X-ray and electron microscopy 3=6903
 foils, thick, neutron activation, self-shielding coeff. 3=4407
 foils, transition radiation and optical bremsstrahlung, rel. to electron bombardment 3=20536
 Gr \ddot{u} neisen γ , temp. depend. calc. 3=10607
 impurity ions in Au, scattering cross-sections and charges 3=17813
 internal friction peaks, low temp. 3=3212
 internal friction peaks at low temps. 3=11136
 interstitial configurations, rel. to deuteron-irrad. 3=22755
 ion emission, secondary, on inert gas ion bombardment, 100-30 000 eV 3=14665
 Kapitza resistance meas. 3=12017
 lattice vacancies, resistivity 3=22893
 liquid, structure, by X-ray scatt. 3=9438
 magnetoacoustic effect to 350 Mc/s, Fermi surface dimensions 3=2759
 magnetoplasma resonance, l.f., meas. 3=8409
 neutron irrad., stage II and III recovery 3=2848
 optical consts., polarimetric method 3=11943
 optical films, preparation and properties 3=9603
 photoelectric emission, by X-rays, 0.28-9 keV, on films, effective depth 3=21864
 photoelectric yield, 3000-250 A 3=21865
 photoelectric yield data, vacuum u.v., 8 to 24 eV 3=13145
 photoelectric yield and work function of films 3=426
 photovoltaic emission into CdS 3=23013
 point defects due to plastic deformation 3=22720
 point defects in irradiated metal, review 3=8420
 point defects, rel. to electron-irrad. 3=22726
 radiation damage by neutrons, from electron microscope examination 3=8939
 range of Be $^+$ ions in, at 2-21 MeV 3=2048
 ranges of N ions, 0.4-6.4 MeV 3=4211
 resistance of films and contacts 3=15537
 resistivity elec., due to Ag and Zn impurities 3=25320
 resistivity, quenched-in, recovery, rel. to dopant 20 $^{\circ}$ -170 $^{\circ}$ C 3=17818
 resonance interaction with slow neutrons at low temp. 3=4801
 secondary electron emission, 1 MeV proton bombardment 3=24344
 semiconductor devices, tunnel diodes, alloyed contacts to Si and Ge, low resistance 3=20360
 shear stress, critical, of single crystals 3=1238
 sound velocity, effect of high mag. field 3=8356
 spike regions, form. by Ar $^{+}$ and Xe $^{+}$ bomb. 3=6552
 sputtering, by A $^{+}$ ions, directional ejection, effect of thermal motion 3=452
 sputtering yield, low energy, guarding effects 3=22876
 stacking fault tetrahedra nucleation 3=22798
 stacking-fault tetrahedra and black spots, rel. to α -irrad., 1-35 MeV 3=17770
 surface roughness, meas. by adsorption of I 131 3=13556
 thermal conductivity, phonon and electron components, separation methods 3=12930
 thermal expansion, 20 $^{\circ}$ -1200 $^{\circ}$ K 3=17663
 thermal expansion, X-ray meas. 3=10605

Gold — contd

- thermal spikes, obs. by sputtered atom energy spectrum 3=8421
 thin films, optical constants, rel. to heat treatment 3=13146
 vacancies and divacancies, diffusion 3=4863
 vacancies, excess, liquidation, rel. to plastic deformation 3=4862
 vacancies, properties 3=22738
 vacancy formation, pressure effect 3=8430
 void formation, strain induced 3=13364
 X-ray spectrum, new L transition, non-quadrupole 3=8183
 zone refinement and activation analysis 3=3345
 Au 199 dissolved in Fe or Ni, local magnetic field, sign 3=5007
- Gold compounds**
 alloys, dilute, conduction electron transfer 3=25220
 alloys, superconductivity 3=16873
 alloys, vacancy-impurity binding energies 3=8424
 antifogging and sensitizing action on photographic emulsion 3=11952
 binary alloys with rare-earth metals, structure 3=18336
 Au alloys, thermoelec. power, effect of transition metals 3=13139
 Au-Ag alloys, conductivity, electrical, changes on heat treatment, due to ordering 3=22894
 AuAl $_3$, de Haas-van Alphen effect 3=12944
 AuAl $_3$, elec. props. meas. 3=10718
 AuBa, spectrum, vibr. analysis 3=19979
 AuCa, spectrum, vibr. analysis 3=19979
 Au-Cd, α , α_2 and β' phases, structure 3=6855
 Au-20% Cd, f.c.c, filings, heavy deform. faulting, by X-ray diffr. 3=8418
 Au-Co (1.57 wt.%), mag. anisotropy, on cold rolling 3=20580
 Au-1.5% Co small particles, electron microscope exam. 3=1090
 Au-Co, thermal cond. at 3 $^{\circ}$ -35 $^{\circ}$ K 3=10614
 AuCu, elec. cond., temp. variation 3=10720
 AuCu II, nucleation, growth from disordered state 3=8901
 AuCu, order and disorder-antiphase transitions 3=8887
 Au-Cu, solidification curves 3=12002
 AuCu II, structure 3=8880
 AuCu $_3$ crystal electron states, energy splitting, calc. 3=17688
 AuCu $_3$, crystal ordering, temp. var., by quenching 3=20871
 Au-Cu-Ni, order, long-range 3=18348
 AuGa $_3$, de Haas-Van Alphen effect 3=12944
 AuGa $_3$, elec. props. meas. 3=10718
 Au-0.25 at.% Hg, neutron irrad., annealing 3=2848
 AuIn $_3$, elec. props. meas. 3=10718
 Au-Mg films, vacuum deposition, orientation 3=20924
 Au-Mn, new hexagonal phase between Au $_3$ Mn and Au $_3$ Mn 3=3312
 Au $_3$ Mn alloy, antiferromag. props. 3=1004
 Au $_3$ Mn, disordered and ordered, magnetic behaviour 3=1003
 Au $_3$ Mn, Curie temp. change by hydrostatic pres. 3=11026
 Au $_3$ MnAl, Heusler alloy, ferromagnetism, -190 to 400 $^{\circ}$ C 3=25520
 Au-Ni alloys, optical props. 3=8580
 Au-Ni, ferromag. precipitates, electron micr. study 3=5138
 Au-Ni, nearest neighbour interact. energy 3=8886
 Au-Pb films, diffusion 3=20226
 AuSb $_3$, de Haas-van Alphen effect 3=12944
 Au-Si complex deposits, electrical conductivity 3=20331
 Au-Si evap. films, structure 3=3354
 AuSn, anisotropic thermoelec. power 3=17972
 AuSn, de Haas-van Alphen effect 3=12944
 AuSr, spectrum, vibr. analysis 3=19979
 AuTe, molecular emission spectrum 3=12819
 Au-Zn, ϵ and η phases, lattice spacings 3=6856
 Au-Zn, de Haas-van Alphen effect 3=12944

Gramophones

See Sound reproduction.

Granular structure

- borosilicate glasses, by electron microscopy 3=13545
 ferrites, micrographic structure 3=3122
 ferrites, rel. to elec. and mag. props. 3=1083
 hydro-extruded 3=1215

Granular structure — contd

- magnets, compacted Fe—Co particle, fracture surfaces, by replica 3=20920
- particle assemblies, stress—dilatancy relation 3=1363
- porous polycrystal, surface intergrain grooves 3=10683
- subsidence trough, expected value 3=14073
- Mn—Ni—Cu alloys, polygonization 3=3315
- Ni, thermomechanical treatment effects 3=3234
- Ni—Cr, fracture, grain junction deform. 3=3239
- Si—Fe, deformed, substructures and recrystallization 3=23468

Graphite

- adsorption of benzene, thermodynamic functions, calc. 3=18398
- adsorption of CO and water vapour 3=13569
- adsorption of monatomic mole. 3=13572
- annealing, rel. to neutron irradi., e.s.r. study 3=22867
- atoms and lattice, repulsion of gas molecule 3=10030
- cast iron, graphitization on solidification 3=11300
- cooling curves, rel. to adsorbed A 3=3907
- creep, transient, and recovery, theory 3=18196
- crystal structure, effect on rhombohedral modification of oxidation, Br and K 3=18309
- crystalline anisotropy by neutron diffr. 3=5101
- crystals, orientation, by X-rays 3=6820
- deformation by thermal cycling 3=23308
- deformation, rhombohedral form prod. 3=25627
- diamagnetic props. rel. to particle size 3=1120
- on diamond, after allotropic conversion at 3000°C, orientation 3=20776
- diamond, conversion, 130 kilobars, 3300°K 3=6819
- dimensional changes from bromine absorpt. and neutron irradi. 3=25309
- direct conversion to diamond in static pressure apparatus 3=8793
- dislocation loops after quenching and annealing 3=4861
- dislocation loops and self-diffusion, rel. to heat treatment 3=17741
- displacement spikes, rel. to neutron-irradi. 3=17703
- elastic constants, pyrolytic material 3=13321
- elec. cond., calcs. for hexagonal layer planes 3=10714
- electrographite, fiction on Cu, surface and crystal structure changes 3=6807
- electrographite, structure, friction, wear 3=8787
- electromagnetic props., low temp., neutron irradi., chemically doped 3=8485
- electron emission, secondary pyrolytic vac.-cleaved material 3=9841
- equation of state, Hugoniot, up to 300 kbars, pyrolytic graphite 3=10608
- etch pits, orientation and shape, variation 3=25662
- graphitic oxide, oxygen atoms distrib. 3=5107
- graphitized carbon black, adsorption of Ar 3=11324
- interstellar particles 3=3537
- ion-bombardment effects 3=22851
- in irons, cast, formation during cooling from 1000-700°C, from u.s. velo. decrease 3=23473
- Kish crystals, oxidation effects, microscopy 3=16031
- lattice vibrs. phonon frequ. distrib. 3=15423
- lattice vibrations in pyrolytic graphite 3=2710
- melting at very high pressure 3=9656
- melting point, high pressure 3=6818
- neutron irradiation effects 3=25027
- neutron-irradi., interstitial annealing and displaced-atom formation 3=788
- neutron irradiated, microstructural changes 3=25651
- oxidation, structural aspects, study 3=20985
- paramag. reson. and relax., single crystals, neutron irradiated 3=13296
- Pile Grade, 450°C, irradi. damage 3=10433
- polycrystalline, e.s.r., theory and meas. 3=3174
- pyrolytic, Ar and air ion-bombardment effects 3=17806
- pyrolytic, elec. properties and structure 3=826
- pyrolytic, Etingshausen cooling 3=15530
- pyrolytic, preferred orientation, and anisotropy ratio 3=20778
- resistance, electrical, 20-200°C, $3 \times 10^4 - 2.5 \times 10^5$ kg/cm² 3=6557
- specific heat, 0.4°-2.0°K, meas. and theory 3=12925
- spin suscept. in low field, e.s.r. meas. 3=25501

Graphite — contd

- structure of cleaved surfaces 3=3261
- surface etching with O₂ 3=1260
- thermal cond., electron irradi. effects, annealing 3=10615
- thermal expansion, accommodation 3=8371
- thermal expansion in a and c directions 3=774
- thermal expansion rel. to temp. and neutron-irradiation 3=2737
- twinning, unusual type 3=13405
- thermal oxidation 3=25821
- vacancies, formation energy 3=22753
- vacancies and interstitials, bond energy 3=8425
- vacancy loops, rel. to irradiation 3=20194
- vacancy loops, rel. to Ni-irradi. and annealing 3=17705
- wear, on metal, mechanism 3=6806
- wear, on steel, effect of current, mechanism 3=6805
- B diffusion 3=13000
- C films, graphitization 3=13395
- I adsorption, meas. 3=20940
- Xe adsorption, 2nd and 3rd virial coeff. 3=5150
- Xe¹³³ fission product diffusion 3=10427

Graphs

See also Nomograms.

- least squares fitting by pair of parallel straight lines 3=18695
- quantitative mapping instrument 3=1649

Gravitation

See also Relativity.

- asymptotic invariants in radiation fields 3=18706
- baryon interaction, in Rayski manifold 3=4334
- Bonnor vacuum field, associated with electromag. field, non-singular 3=16519
- central symmetric fields 3=23745
- centripetal force reactions, aberrated, grav. theory 3=21224
- coeff. of absorption, new upper limit 3=6944
- constant, possible time variation, rel. to continuous creation of matter 3=21212
- control and generation of gravitational forces 3=11678
- cosmology, grav. eqn. and isotropic model 3=23661
- cosmology, nonhomogeneous isotropic universe, gravitational law 3=23662
- cosmological solutions, singularities, geom. anal. 3=3724
- covariant field theories 3=3714
- e.m. energy—momentum tensor, geom. significance 3=25
- Dirac's hypothesis, geophys. consequences 3=5177
- Dirac particles, gyro-gravitational ratio 3=17180
- Einstein's eqn., generalization for energy conservation 3=18704
- Einstein field eqns., divergence conditions 3=16500
- Einstein—Rosen manifolds, initial-value problem 3=18705
- Einstein spaces with maximum mobility 3=5346
- Einstein theory, rel. to fundamental symm. in physics 3=3709
- electromagnetic theory, perihelion motion 3=23737
- and electromagnetism 3=7108
- electron motion, geodesic departure, drag energy loss 3=18708
- energy radiation 3=23743
- equation of motion for particle, by reference to ennuple system 3=18709
- equivalence principle 3=16497
- Euclidian field theory, action-integral identities 3=9329
- Euclidian field theory, energy—momentum 3=9330
- Euclidean theory of field, energy—momentum 3=3715
- expanding universe, canonical formalism 3=39
- expanding universe, quantization 3=11503
- external field; hydrodynamic mass tensor 3=27
- external field, mass tensor, components, equation system 3=26
- field energy and g₀₀ 3=14002
- in field theory, soluble 3=5331
- flat space theory, energy—momentum tensor choice 3=16498
- fluid mass, rotating, grav. field 3=1600
- gas in uniform rotation, instability 3=9155
- gas, instability, infinite cylinder, surface disturbances 3=23698

Gravitation — contd

- generalized Bondi—Metzner asymptotic symmetry group 3=3716
 geodesic hypothesis 3=23736
 geodesic hypothesis 3=3721-2
 gravitational field quantization 3=3719
 gravitational fields, calc., systematic approx. 3=3718
 gravitational fields, self-conjugate 3=23741
 gravitational interaction prescribed by tensor field 3=30
 gravitational radiation by relativistic particle 3=5335
 gravitational waves, book 3=24
 gravitodynamics, Coulomb and Lorentz gauges 3=23744
 graviton of spin 2, 1, 0, from electron inertial tensor 3=28
 graviton, stability against radiative decay 3=29
 Hund theory, space time 3=7098
 inertia due to cosmic gravitational field 3=16504
 inertial rotation in weak gravit. field 3=9331
 instability 3=23742
 instability in nonuniform mag. field 3=9154
 interaction decrease with time rel. to K—Ar ages in meteorites 3=11523
 interaction, effect of intermediate medium 3=7100
 interaction picture for quantized theory 3=7099
 Jordan's κ -theory, exterior solns. 3=14003
 Lagrange's three particles 3=7079
 Lagrangian, polynomial expansion, quantization 3=16502
 light deflection by sun 3=38
 Mach's principle, and finite universe 3=5348
 magnetogravitational instability of rotating medium 3=9159
 neutrino, graviton, and baryon effect on expanding universe 3=1507
 Newtonian, superpotentials 3=1592
 Newtonian theory in affine 4-space geometry 3=23738
 Newton's law, validity at cosmic distances 3=23659
 nonuniform media, instability 3=9158
 observational tests of theory, review 3=3717
 one-dimensional fields 3=5333
 particle of finite size in gravit. fld. 3=3720
 Petrov types of vacuum metric, theorem 3=3713
 phase waves, concept 3=23746
 photon—graviton interaction in first approx. 3=5349
 point masses in Kepler orbit, grav. radiation 3=16514
 point of bifurcation along sequence of Jacobi ellipsoids 3=1594
 potential fields, vertical derivatives, second order, numerical calc. methods 3=18696
 potentials and superpotentials of homogeneous ellipsoids 3=1593
 quantized field and gauge conditions 3=11679
 radiation, in first approx. to Einstein's eqns. 3=5334
 radiation recoil, classical, calc. 3=16515
 review, historical, relation to mass, cosmology 3=21213
 rotating sphere, Einstein field 3=16503
 Schwarzschild soln., singularity, removal 3=3723
 single-body problem in the various theories 3=23739
 spin effects, from Dirac-type wave equation 3=16499
 superpotential and supermatrix of heterogeneous ellipsoid 3=1595
 tetrad fields to describe gravitation, consequences 3=23740
 theory of compensating fields 3=16494
 theory, harmonic coord. conditions, rel. to Newtonian motion eqns. 3=23758
 three-body plane problem, Riemannian metric curvature 3=14070
 three-body problem, Birkhoff—Merman method, extensions 3=18768
 three body problem, exact solutions, different inverse power laws 3=21276
 unified theories 1934-44 3=14017
 variation of grav. const., best using white dwarfs in galactic clusters 3=5336
 variation of interaction, rel. to radioactive decay ages of rocks and meteorites 3=7017
 wave field theory, invariant formulation 3=5337
 wave radiation, and mass quadrupole 3=16501
 waves, energy transfer 3=21210
 waves, low-freq., detection, sensitivity 3=1591
 waves, recoil of emitting system, conditions 3=5838
 waves, review 3=21211

Gravitation — contd

Weyl tensor, algebraic props. 3=18707

Gravity

See also Geophysical prospecting.

- acceleration of gravity apparatus 3=11658
 anomal., mass and depth meas. 3=18470
 anomalies obscured by regional effect 3=8999
 anomalies, statistical analysis 3=5178
 anomalous subsurface mass det. from grav. anomaly 3=5180
 coeff. of absorption, near upper limit 3=6944
 earth's field and continentality 3=9001
 earth-tide observations, during IGY 3=13637-38
 Eötvös expt., spatial isotropy and covariant field theories 3=3714
 field, tesseral harmonics, from satellite camera obs. 3=11375
 gravimeter on vibrating earth 3=23562
 gravitational effects, measurement, limitations. 3=25858
 gravity—acoustic wave propag. in atmosphere 3=9061
 harmonic analysis of world-wide material 3=5179
 hydrodynamic earth model 3=16188
 La Coste—Romberg surface-ship meter, tests 3=13636
 measurement, review 3=5181
 meter, Graf—Askania Gss2, No 13, response study 3=8994
 meter, precision airborne, quantitative evaluation 3=8996
 meter, sea, Gss2, automation 3=1410
 meter, S-9, La Coste and Romberg, reliability detm. 3=8997
 meters, damped, on mobile base, recording duration 3=8998
 meters, Graf—Askania and La Coste—Lomberg, comparison 3=8995
 Newton integral transform, inversion 3=1583
 sea-surface measurements, second-order errors 3=11374
 upward continuation systems, appl. 3=9000
 vert. gradient, and rock densities in situ, in Mohole 3=16187
 water drop shapes under low gravity 3=18668
 waves, standing axisymmetric, on water, period 3=11376
 zonal harmonics, even, 2nd-12th 3=13639

Group theory

- bi-orthogonal system of symmetric character 3=7
 compensating fields 3=16494
 Galilei group and Liouville eqn. 3=15
 Galilei group and quantum theory 3=16523
 invariant operators of Casimir type 3=3707
 irreducible representation multiplicity, of SU(3) 3=7095
 Lorentz group, restricted, and holomorphically related groups 3=5320
 motion in classical and relativistic mechanics 3=19
 quantum theory, relativistic 3=4308
 relativistic quantum mechanics 3=7113
 R_n subgroups, particle charge symmetries 3=19548
 rotation group representations 3=7096
 semisimple Lie groups SU_n 3=11663
 symmetry groups and equations of motion 3=23730
 3 + 2 de Sitter group, representations 3=18693
 unitary group, irreducible represent., bases 3=23731

Gyromagnetic effect

- e.m. shock waves in gyromag. media 3=24466
 γ - Fe_2O_3 , resonance at 9500 Mc/s 3=23201
 intrinsic and external permeabilities and susceptibilities of gyromag. materials 3=25498
 Y garnet, effect of method of prep. 3=8699

Gyromagnetic ratio

- deformed nuclei, odd A, $153 < A < 187$, g_R , g_K , calc. 3=7070
 differential ang. correl. study 3=10224
 free electrons, direct meas. of anomaly 3=24691
 magnetomechanical detm. 3=467
 meas. for short-lived nuc. states 3=634
 Ce^{140} , 2-083 MeV state, g-factor 3=8002
 Fe^{56} , 1st excited state 3=17407
 $Gd^{154, 156}$, first excited 2^+ states 3=628
 Os^{188} , 2^+ state 3=4555
 Sm^{152} , first excited 2^+ state 3=628
 U^{233} , ground-state 3=10318
 W^{182} , first-excited level 3=24873
 W^{182} , 2^+ rotation level g_R factor 3=8013
 $Y_{In}Fe_{3-x}O_{12}$, ($x < 0.5$) 3=20800

Gyroscopes

- analogy with celestial bodies and earth, satellites, artificial 3=16320
- demonstration type 3=11741
- equations of motion, asymptotic, for negligible friction at suspension axes 3=5397
- gyrotron, principles 3=5402
- horizontal gyrocompass, dynamics 3=23821

Hafnium

- foil, prod. for nuclear work 3=19501
- meteorites, abundance 3=11527
- nuclear orientation of Ta¹⁸¹, from decay anisotropy, temp. var. 3=20069
- polycrystalline, static quadrupole interaction 3=4803
- specific heat, 1.1°-4.5°K 3=15437
- vaporization 3=7390
- HfIII, Slater parameters for spectrum 3=703

Hafnium compounds

- HfB₂, work function 3=14616
- HfC, thermionic emission, 1300°-1900°K 3=16974
- HfC, work function 3=14616
- HfC-UC solid solubility at 2000°C 3=25759
- Hf₂(In_{0.5}Sb_{0.5})₃, lattice parameters 3=25725
- Hf-Nb, superconducting in high mag. fields 3=16879
- HfO₂, Debye temp. 3=12568
- HfO₂, defect structure rel. to O₂ press. 3=12957
- HfO₂, monoclinic-tetragonal transition 3=25654
- HfO₂, vaporization and dissociation energy 3=7390
- HfO₂, work function 3=14616
- Hf-Ta, paramag. susceptibility rel. to temp. 3=999
- Hf-Ta, superconducting in high mag. fields 3=16879

Hall effect

- See also Semiconducting materials; Semiconductors.
- accelerometer, spring system 3=21287
- alloys of transition elements in normal metals, low temp. anomalies 3=8496
- analogue divisor, InSb 3=13998
- Boltzmann transport eqn. in elec. and mag. fields 3=25226
- rel. to carrier scattering study 3=17845
- Corbino disk meas. 3=9691
- ferromag. metals, on localized d-electron model 3=827
- ferromagnetic, theory 3=20275
- ferromagnetics, spontaneous, theory 3=6562
- graphite, neutron irradi., chemically doped, low temp. 3=8485
- graphite, pyrolytic, rel. to structure 3=826
- graphite, theory 3=10714
- high-field meas. by inductive method 3=840
- liquid metals, meas. 3=7218
- luminescence, signs of charge carriers, meas. 3=10979
- magnetohydrodynamic generator, flow, one dimensional theory 3=17045
- measurement, d.c. method for liquid metals 3=16636
- measuring devices, improved 3=12042
- metals, during melting 3=21402
- metals, liquid 3=143
- metals, liquid 3=3814
- microwave frequency converter based on Hall effect 3=10864
- molten metals and semiconductors, appar. 3=9475
- oscillations in layered lattice, Kubo theory 3=20259
- polaron, small, mobility theory 3=12950
- polarons, small, band motion, theory 3=25255
- semiconductor, electroless meas. technique 3=342
- semiconductors, calc., use of resistance network 3=13050
- semiconductors, ferromagnetic, spontaneous, theory 3=22918
- semiconductors, due to hot carriers in strong mag. fields 3=10760
- semiconductors, isothermal coeff., multi-band calc. 3=10754
- semiconductors, low-mobility, theory 3=15565
- semiconductors, many-valley, for high elec. field 3=22916
- semiconductors, during melting 3=21402
- semiconductors theory, carrier drag effects 3=6575
- AgBr, mobility of holes 3=13080
- AgCl, electron mobility in high elec. fields 3=8387

Hall effect - contd

- AgSbTe₂ 3=10900
- AgSbTe₂, anomalous 3=836
- AgSbTe₂ phase, 77°-300°K 3=18345
- Ag₂Te, +20° to -190°K 3=20343
- β-Ag₂Te, liq. N to room temp. 3=837
- AgZn 3=838
- Ag-Zn, β, β' and ζ-phases 3=8396
- Al, anisotropy in strong fields at 4.2°K 3=22903
- Al, and crystal point defects, due to α-rays and cold working, temp. var. 3=17816
- Al films, evaporated, in vacuum 3=8494
- Al, at 4.2°K, in high field 3=840
- Al, polycryst., Hall field, rel. to excess vacancies and dislocation loops, 20°K 3=4907
- Al thin films, cooled layers, Hall const. 3=4906
- AlSb-GaSb 3=25352
- As films 3=17875
- AuAl₂, liq. He to room temp. meas. 3=10718
- AuGa₂, liq. He to room temp. meas. 3=10718
- AuIn₃, liq. He and room temp. meas. 3=10718
- BaTiO₃, doped, and elec. cond., temp. depend. 3=8515
- Bi, isothermal, at liq. He temps. 3=25354
- Bi, pure, coefficient 3=10807
- Bi, thin films 3=6564
- Bi and Bi-Sb alloys, var. with grain size 3=20323
- Bi₂Se₃, and doping mechanism 3=8516
- Bi, with Se admixture 3=4904
- Bi-0.2 at. % Sn, 77°K 3=25355
- C, pyro layers, effect of heat treatment 3=20272
- Cd, liquid, d.c. results 3=16636
- Cd, molten 3=9475
- CdS, Cu doped 3=2906
- CdO films, doped and undoped 3=25359
- CdS 3=25360
- CdS, n-type, lightly doped, mobility 3=863
- CdS, rel. to carrier props. 3=8523
- CdSb, pure and doped 3=17971
- CdSb, temp. var. 3=25358
- CdTe, n-type, meas. 3=8519
- Co, anisotropy, crystal symmetry 3=841
- Co, thin films, perpendicular 3=17822
- Cr nitrides 3=865
- CsAu 3=20328
- Cu, and crystal point defects, due to α-rays and cold working, temp. var. 3=17816
- Cu₂Au, after quenching, long-range order 3=20889
- Cu₂Au alloy, rel. to ordering process 3=3331
- Cu₂Au, influence of ordering 3=839
- CuFeS₂ 3=1027
- Cu₂O, rel. to defect structure 3=22735
- Dy, 4.2-350°K 3=25322
- Er, 4.2-350°K 3=25322
- Ga films 3=17875
- Ga, liq., meas. 3=1710
- Ga, molten 3=9475
- GaAs, photo-Hall effect in high-resistivity crystals, temp. depend. 3=6632-3
- GaAs, rel. to elec. fld, 4°-30°K 3=10813
- GaP, 78°-100°K 3=17879
- GaSb, n-type 3=10819
- Ga₂Te₃ (59.5-60.0 at. %) Te 3=10815
- Ge, anisotropy, 77°-300°K 3=10777
- Ge, Sb- and As-doped, rel. to compression, 1° to 300°K 3=22931
- Gd, anomalous, rel. to f-cond. electron coupling 3=8400
- Gd, ferromag., origin 3=15556
- Gd, 0-370°K 3=8497
- Ge, carrier concentration discrepancy, rel. to impurities 3=17861
- Ge rel. to electron-irrad. 3=22859
- Ge, molten 3=9475
- Ge n-type bicrystal, coeff. at grain boundary 3=8506
- Ge, n-type, for current flow along tilt and twist grain boundaries 3=854
- Ge, n-type, degenerate, stress effects, as valley splitting 3=10787
- Ge, 2nd and 3rd Cu levels, activation energies rel. to temp. 3=17849

Hall effect—contd

- GeTe, carrier compensation for various solutes 3=25365
 Hg, liquid 3=144
 Hg, liquid 3=9475
 Hg, liquid, d.c. results 3=16636
 Hg, meas. 3=7218
 Hg[Cd]Te—In₂[Ga]₂Te₃, solid solutions 3=11301
 Hg—In alloy, liquid 3=9476
 HgTe—CdTe, rel. to composition 3=17890
 In, at 4·2°K, in high field 3=840
 In, liquid 3=144
 In, liquid, d.c. results 3=16636
 In, liquid, meas. 3=7218
 InAs, at low temps. 3=6596
 InAs, n-type, in pulsed magnetic field; 20°-360°K 3=4925
 InSb, hot electrons, drift velocity meas. 3=8586
 InSb, rel. to mag. fld. intensity 3=17881
 InSb, Se doped, independent of mag. field, 0.1-22 kOe 3=17883
 InSb, 77-450°K, 25-25kOe 3=25367
 InSe, 300°-600°K 3=13073
 K, at 4·2°K, in high field 3=840
 Li, at 4·2°K 3=840
 Mg₂Ge_xSi_{1-x}, 250-600°K meas. 3=13142
 Mn_{1.18}Fe_{1.84}O₄, heat treatment depend. 3=22949
 Na, at 4·2°K, in high field 3=840
 Na, molten 3=9475
 Nb—Zr alloy, supercond. and normal 3=13043
 Ni alloys, extraord. Hall conductivity 3=15551
 Ni, anisotropy, crystal symmetry 3=841
 Ni, thin films, at 300°K 3=4905
 Ni thin films, e.m. force 2° to 300°K 3=832
 Ni thin layers, rel. to ferromag. Curie pt. 3=1077
 Ni—Fe films, ordinary-extraord. transition 3=22907
 P, black, crystalline 3=17891
 Pb, liquid, d.c. results 3=16636
 Pb, liquid, meas. 3=7218
 PbSe, mobility, rel. to controlled deviation from stoichiometry 3=22736
 PbTe, coeff., rel. to carrier conc. and temp. 3=867
 Pd, role of hydrogen atoms 3=25749
 Pu, α -phase, 78°-388°K 3=17824
 Sb, molten 3=9475
 Sb₂Te₃ films meas. 3=8514
 Si, carrier concentration discrepancy, rel. to impurities 3=17861
 Si, heavily doped, electron mobility 3=25347
 Si, n-type, piezo-effect 3=15582
 Si rel. to electron-irrad. 3=22859
 Si, zone-refined, p-type, in-pile coeff. 3=17867
 Si:Li, temp. depend., radiation defects study 3=22849
 Sn, liquid 3=144
 Sn in strong mag. fields 3=15555
 SnTe, meas. rel. to stoichiometry 3=6604
 Te, and paramag. reson., 1.5-60°K 3=13308
 Te, liquid meas. 3=7218
 Te liquid, up to 850°C 3=9474
 Te, molten 3=9475
 Te, purified, rel. to structural defects 3=17898
 Ti, effect of preferred orientation 3=22906
 Ti hydrides, 77°-300°K 3=13026
 TiO, 80°-400°K 3=17894
 TiO₂ 3=22955
 UO₂ single crystals, 90°-900°K 3=25372
 WO₃ 3=13083
 Zn, liquid, d.c. results 3=16636
 Zn, by He temps. meas. 3=8492
 Zn, molten 3=9475
 ZnSb, electrical properties, rel. to temp. 3=25373
 ZnTe 3=25374

Halogens

- alkali halides, lattice energy, calc. 3=17627
 atoms, electron affinities 3=12759
 bonds, H, halide anions as proton acceptors 3=17566
 compounds, metals, heavy; luminescence 3=10990
 crystals, diatomic molecular, librational motion 3=745
 inert gas halides, binding 3=4750

Halogens — contd

- molecules, electron affinities and charge-transfer frequency 3=8257
 molecules, gaseous, vibrational relaxation times 3=9504

Hardness

- See also Abrasion; Work hardening.
 alkali halide crystals, rel. to point defects, 20.5°-300°K 3=23364
 alloys, fatigue hardening, for low stacking-fault energy 3=20736
 Armco iron, effect of electrolytic H 3=3245
 diamond 3=25445
 frictional force rel. to microhardness 3=13388
 glass, rel. to local stresses and environment 3=18365
 glass, rel. to thickness and heat treatment 3=3229
 indentation meas., with electron microscope 3=20759
 Magnox ZR 55, influence of H₂ pick-up 3=25761
 metals, low temps., rel. to flow stress 3=6789
 precipitation, review 3=20893
 Rockwell, meas. indenter method 3=1246
 semiconductors, resistance to indentation rel. to potential 3=23365
 steel, austenitic, stainless stabilized with Ti, rel. to heat treatment 3=3337
 steel, case-hardened layer, heat treated 3=1247
 steel, hardening techniques 3=1235
 substitutional solution hardening 3=11186
 transition metals, rel. to neutron irradiation 3=8784
 wedge indentation, and steady creep condition 3=3228
 Zircaloy-2, rel. to irradiation 3=11170
 Al, cold-deformed, relax. curves 3=11187
 Al, and conductivity, electrical, changes on cold working 3=13373
 Al crystals, hardness anisotropy 3=3246
 Al, fatigue hardening 3=11328
 Al—Cu alloys, age hardening, effect of impurities and reversion treatment 3=3332
 AlNiCo 500, AlNi, magnets' structural constituents, by microsonde and microhardness 3=16090
 CaF₂, hardness rosettes and impression shapes 3=16009
 Cd, hardening by strain cycling 3=13372
 Cr ferrite, softening, effect of alloying elements 3=20900
 Cu—Al martensites meas. 3=20869
 Cu, cold-deformed, relax. curves 3=11187
 Cu, and conductivity, electrical, changes on cold working 3=13373
 Cu films, vacuum evap. 3=1366
 Cu, hardening, by neutron-irrad., low-temp. 3=23340
 Cu, neutron irradiation, recovery mechanism 3=20721
 Cu, quench-hardening and resoftening 3=8907
 Cu(A^{IV}B^{VI}) type semiconductors 3=13513
 Cu₃Au, ordered, strain hardening 3=16001
 Cu—Si—(Mn) alloys, microhardness rel. to deformation and annealing 3=22701
 Cu—Zn—Sb alloys 3=23466
 Fe, hydro-extruded 3=1215
 Fe, rel. to neutron irradiation damage 3=8759
 Fe—Al—C alloys, rel. to C content 3=13525
 GaTe, microhardness 3=11277
 Ga₂Te₃, microhardness 3=11277
 Ge— α -Fe solid solution 3=3340
 InSb, micro, faces, anisotropy 3=18217
 KCl, electron and γ -irrad., hardening and F-band coloration 3=23359
 KCl, hardening by colour centres 3=22833
 KCl, hardening by quenching and irradiation of single crystals 3=16008
 MgO, rel. to irradiation 3=17761
 MgO, rel. to neutron-irradiation 3=18185
 Mo, irradiation hardening, rel. to grain boundaries 3=4881
 Mo, n-irradiated, increase on annealing \leq 500°C 3=20730
 Na, polymorphic transform. 3=3224
 NaCl—NaBr alloys, microhardness 3=15993
 Nb, neutron-irradiation hardening 3=11169
 Nb—Zr alloys 3=19115
 Ni, and conductivity, electrical, changes on cold working 3=13373
 Ni, effect of electrolytic H 3=3245
 Ni₃Pt, effect of short-range order and annealing 3=8906

Hardness—contd

- PbSe-Bi₂Se₃ system, microhardness, rel. to composition 3=25742
 PbSe-Sb₂Se₃ system, microhardness rel. to composition 3=25741
 PuC, 42-60 at.% C 3=10431
 ReSi₂ 3=872
 Sb, microhardness decrease, rel. to i.r. irradiation 3=18218
 Sn, effect of Na and Zn traces 3=3334
 Sn, recrystallized surface, effect of Zn and Na impurities 3=20760
 Ta, effect of electrolytic H 3=3245
 Te(50-80%)-Ga, microhardness 3=11277
 Ti-Cr alloy, effect of heat treatment 3=20879
 TlAsSe₂, glassy effect of I and Ge impurities 3=15635
 TiC-WC-Co 3=3316
 γU-6 at.% Mo 3=25764
 UC, microhardness 3=7079
 V, var. with annealing temp. and deform. 3=5137
 Zn, effect of microsegregations 3=6792
 Zr, rel. to annealing and impurities 3=17745

Harmonic analysis

See Acoustic analysis; Calculating apparatus; Fourier analysis.

Hearing

See also Ear; Speech.

- absolute pitch, origin 3=18678
 acoustic transients, lateralization 3=3673
 artificial ear, acoustic coupling rel. to elec. impedance of receivers 3=3653
 audiometer, Békésy, clinical and phys. uses 3=3669
 audiometer, principles and history 3=16452
 auditory intensive difference limen, influences 3=18675
 auditory perception and unmasking 3=21167
 auditory system, integrative and decay actions 3=3686
 aural reflex 3=13960
 beat tones, neurological theory 3=13957
 binaural detection of single-freq. signals, effect of noise 3=7065
 binaural interaction, Békésy model 3=3672
 binaural interact. of click and click pair 3=16448
 binaural masking-level diff., cancellation theory 3=21162
 bone conduction, review and work of Békésy 3=3668
 brief signal, intensity, first neuron level 3=18677
 bullfrog, auditory units in eighth nerve 3=21170
 cats, masking of tones by noise 3=9301
 competing messages varied in no., rate, level 3=11623
 comprehension of simultaneous spoken messages 3=1552
 damage-risk criteria for pure tones and noise 3=1554
 deafness surgery, rel. to middle-ear mech. 3=3666
 dichotic clicks, temporal order and loudness perception 3=13951
 differential intensity thresholds, differences for clicks 3=18676
 DL's, cumulation for intensity change at low-sensation levels 3=18672
 DL's, low-frequency, rel. to high-frequency-noise 3=18671
 directional, effect of oxygen intake, reduced blood flow 3=21148
 ear-protecting devices, noise atten. 3=16453
 foreign accent and speech distortion 3=13949
 frequ. and amplitude modulations, sensations comparison 3=3671
 frequency discrimination of pulsed tones 3=21160
 frequency discrimination of short tones 3=16449
 hearing judgments, based on distance estimates 3=13961
 hearing-loss rel. to noise spectrum 3=21164
 intensity discrimination, rel. to stimulus presentation 3=1559
 intensity judgment, inborn ability 3=13959
 intra-aural muscle reflex meas. 3=3675
 killifish, sensitivity of lateral-line organ 3=7069
 late realization and loudness of clicks, effect of noise 3=1555
 localization, changes due to masking 3=9298
 loudness of clicks, estimation 3=3676
 loudness discrimination, general law 3=1561
 loudness and "distance" judgement, and partition scales 3=3674

Hearing—contd

- loudness growth, intensity discrim. in auditory fatigue 3=3681
 loudness judgments, based on distance estimates 3=13961
 loudness levels, calc. for musical sounds 3=1558
 loudness threshold for v. short stimuli 3=13952
 masking with white-noise stimuli 3=21159
 monaural detection, energy detector model 3=13958
 monaural, energy detection model 3=7066
 monaural loudness function at 1000 c/s, and interaural summation 3=18673
 noise, interaural correlation 3=3677
 nonlinearity, hydrodyn. and frequ. theories 3=9295
 perceived noise level, rel. to spectral content and duration 3=18674
 perception of formants 3=13950
 periodicity analysis, lower limits 3=13962
 periodicity perception using gated noise 3=21163
 pitch, experimentally induced shifts 3=21158
 pitch perception 3=13955
 pitch rel. to time delay between 2 pulse trains 3=21166
 pitch of the residue, effects of shift 3=3670
 recognition time for multi-dimensional signals 3=9300
 recovery after short-duration fatigue 3=16447
 reverberation effect on assessment of impulse noise 3=3680
 short tones, discrimination and loudness 3=21161
 sensory threshold and response bias 3=26000
 signal detectability theory for matching procedures 3=3678
 speech masking by white noise rel. to stimuli presentation method. 3=9296
 steady and intermittent sounds and alternating noise-burst stimuli 3=7067
 talker recognition, pattern-matching procedure 3=11624
 temporal summation, tones in narrow-band noise 3=16450
 temporary threshold shift after noise increase 3=9297
 threshold mechanism, noise masking 3=16451
 threshold shift, rel. to protective device testing 3=1557
 thresholds, statistical analysis for 550 000 people 3=21157
 tonal residue 3=21165
 tracking of pitch 3=13953
 two-component noise bursts perception 3=7068
 two-component tone quality, phase effects 3=3679
 vowel sound perception, principle formants 3=9294
 white noise, onset discrimination 3=13956
- Hearing aids**
 synthetic word in auditory correction 3=3682
- Heat**
 See also Radiation, heat; Thermodynamics.
 Lorentz transformation 3=24070
 water in toy-boat, propulsion method 3=9638
- Heat capacity**
 See Specific heat
- Heat conduction**
 See also Conductivity, thermal.
 between two rough surfaces, various compressions and surface finishes 3=16821
 at bonds, between sheet materials, use in testing 3=13984
 composite continua bounded internally by circular cylinder 3=24080
 contact thermal resistance, reduction of 3=24083
 coupling to mechanical plasticity 3=9380
 crystals, edge dislocations, lattice thermal cond. 3=17673
 crystals, paramag., contrib. of phonon coherent paramag. diffusion 3=10585
 crystals, phonon scatt. at localized modes 3=22640
 crystals, phonon scatt. by point defects 3=22639
 crystals, rel. to lattice energy current 3=25186
 cylinder, infinite, temp. distrib. function 3=19043
 cylinders, hollow, semi-inf., Greenberg soln 3=19041
 equation, implicit numerical methods 3=1851
 equation, many-region, time-dependent, simplification 3=5546
 ferromagnetic, by magnon-magnon scatt. 3=10617
 fluids, equilibrium fluct., collective motion 3=8140
 fluid under shear flow, heat diffusion 3=3797
 gases, kinetic theory, relativistic 3=23927
 gases, rel. to dissociation and ionization 3=3831
 heat transfer bibliography 3=7364

Heat conduction — contd

- heat transfer from fine wire, kinetic theory 3=1848
- heterogeneous wall, thermogram solution 3=16823
- hollow cylinder, heated decreasing with time 3=16824
- infinite rod, differential eqn. 3=7132
- interior value problems; slab, cylindrical, spherical geometry 3=23
- liquids, rel. to molecular force correl. 3=129
- metal-ammonia solutions 3=14149
- metals, directional effects at interface 3=1846
- multi-layer media with internal heating, planar 3=16820
- plane parallel layer, temp. distrib. function 3=19042
- polycrystal, rel. to cond. of single crystal 3=10712
- potential field "form factor", depend. on Biot boundary condition 3=21207
- semiconductor alloys, disordered, lattice theory 3=25207
- semiconductors with arbitrary energy surfaces 3=17840
- semiconductors, with non-equil. concns. 3=17841
- semi-infinite solid with moving heat source 3=16822
- slab, one face heated decreasing with time 3=16824
- solid body, semi-infinite, combustion zone speed towards interior 3=11875
- solids, Boltzmann transport eqn. 3=25226
- solids, energy flux operator for lattice 3=25206
- solids, isotropic, homog. and semi-inf., temp. distrib. 3=19040
- solids, second sound, macroscopic theory 3=25193
- superconductors, intrinsic electronic cond., theory 3=5581
- thermoelastic waves transmission across boundary 3=7156
- time-dependent heat sources, integration procedure 3=1852
- transparent body in presence of radiation, theory 3=24081
- He II, in capillaries 3=310
- MnF₂, antiferromag., lattice thermal cond. theory 3=25212

Heat losses

See Heat transfer.

Heat measurement

See Calorimeters; Calorimetry.

Heat of adsorption

- Ar on graphitized carbon black 3=11324
- H, atomic on Al surface 3=25780
- W, adsorption of Ba and CO 3=18394

Heat of combustion

- cyanocarbons 3=18439
- gelatine, blasting, 1-11 kp/cm² pressure 3=3394

Heat of crystallization

- silicates, from structure analogy 3=18269
- Fe-Cr alloy, alloying 3=24097
- Fe-Ni alloy, alloying 3=24097
- Ni-Cr alloy, alloying 3=24097

Heat of dissociation

- Bi vapour 3=9662
- CF, CF₂ from spectra, absorpt. 3=15345
- S_n → S_n (n = 2, 3, 4, 5, 6, 7) 3=25805

Heat of formation

- cyanocarbons 3=18439
- difluorodiazine, isomers 3=8960
- ethyl radical 3=20978
- methylene 3=18438
- solid solutions, alkali halides, NaCl type 3=13390
- AgZn, three structural phases 3=1352
- B₂D₃ 3=6913
- (BOCl)₃ 3=23538
- CsCl type solid solutions 3=18230
- Cu-Zn, Ga and Ge solid solns. 3=6872
- Ga chalcogenides 3=25825
- S₂O, mass spectroscopy det. 3=1385

Heat of fusion

- alkaline earth and rare earth halides 3=19065
- cyanocetylene 3=7216
- graphite 3=9656
- graphite, 48 kilobars 3=6818
- BeO-CaO mixture 3=293
- BeO-Li₂O mixture 3=293
- CaO-Al₂O₃ mixture 3=293
- CaO-B₂O₃ mixture 3=293
- K₂CO₃ 3=22663
- KNO₃ 3=21617
- Li₂CO₃ 3=22663
- LiNO₃ 3=21617

Heat of fusion—contd

- Na₂CO₃ 3=22663
- NaNO₃ 3=21617
- NaOH and monohydrate 3=7388
- Ni, 99.95% pure 3=8359
- TeO₂ 3=770

Heat of reaction

- alkanes, heats of mixing, congruence, validity 3=23535

Heat of solution

- AgCl, solid, in molten KNO₃ 3=14153
- Ar-CH₄ 3=1682
- CO-CH₄ 3=1682
- He³, liq., dilution by He⁴, refrigerator for <1°K 3=5565
- NaOH and monohydrate 3=7388

Heat of sublimation

- metals, and m.p., bond strength, interatomic, var. with electronic structure 3=20045
- selenides 3=24116
- boron 3=305
- B₂O₃ 3=25809
- Bi films, condensation 3=19074
- In films, condensation 3=19074
- CaF₂ 3=12007
- CaO 3=19075
- GeTe, 683°-837°K 3=295
- LiBO₂ 3=25807
- LiBO₂ 3=25809
- Li₂O 3=25809
- NaBO₂ 3=25807
- Sc, from v.p. meas. 3=24119
- SnSe 3=21637
- SnTe 3=21637

Heat of transformation

- elastic energy contribution 3=20769
- Fe, A₃ and A₄, free energy curves 3=10598
- Fe-Cr alloy, σ → α 3=24097

Heat of vaporization

- binary azeotropic mixtures, with min. b.p. 3=21630
- cyanocetylene 3=7216
- cyanocarbons 3=18439
- metals, and surface tension 3=21602
- 1, 2-difluorobenzene 3=8291
- saturated, isomerizing vapour, temp. coeff. 3=11833
- B₂O₃ 3=25807
- CaO, from mass spectr. of vapour 3=1875
- Cu, meas. by mass spectr. at 298°K 3=1876
- H₂, para, calc. 3=14424
- Hf 3=7390
- LiBO₂ 3=25807
- LiBO₂(g) → Li₂(BO₂)₂(g) 3=25807
- Mo, meas. by mass spectr. at 298°K 3=1876
- Na vapour, and specific heat, inconsistency 3=21444
- NaBO₂ → Na₂(BO₂)₂(g) 3=25807
- Ni, meas. by mass spectr. at 298°K 3=1876
- Pd, meas. by mass spectr. at 298°K 3=1876
- Rh, meas. by mass spectr. at 298°K 3=1876
- SbBr₃, and bond energy 3=21629
- SbI₃, and bond energy 3=21629
- Ta, meas. by mass spectr. at 298°K 3=1876

Heat of wetting

- Al, powder, by hydrocarbons, in solution 3=16131

Heat radiation

See Radiation, heat.

Heat transfer

See also Convection; Heat conduction; Radiation, heat.

- acoustic vibs., effect of 3=21582
- air, stagnation-pt., ionization effects 3=18853
- air, supersonic flow, circular pipe with large temp. differences 3=14193
- annulus, laminar flow, theory 3=274
- bibliographies 3=11971
- bibliography, comprehensive 3=7364
- bibliography, Japanese works 3=14391
- bibliography, Russian works 3=11972
- bilateral, fluid flowing in concentric annulus 3=7365
- boiling, nucleate, from horiz. surface 3=1869
- boundary layer flow, turbulent incompress. 3=5410
- boundary layers, turbulent, convection 3=11968
- ceramic fuel pin for nuclear reactor 3=17514
- in circular pipe, with and without heat sources 3=14297

Heat transfer — contd

- compressible gas flow, boundary layer calc. 3=18842
 condensation, dropwise, mechanism 3=12009
 conduction in presence of radiation, theory 3=24081
 cross-current processes in non-steady state 3=7367
 cyclohexane, and ion mobilities 3=14148
 diffusivity meas. using laser flash 3=3910
 dynamical theory for subsystem interaction 3=24079
 effect of sound waves 3=11973
 effects of ionic currents 3=24074
 equation, two three-level difference analogues, for several space variables 3=14392
 from electrically-heated surface, temperature 3=19034
 and flow, gases, with friction, skin, uniform channel 3=14194
 immiscible liquids interface, bubble-stirred 3=21325
 in film boiling, horizontal surface 3=1849
 film condensation in forced laminar flow 3=300
 flow in system of cylindrical symmetry 3=19032
 from flames, plasma torch and oxy-hydrogen flame 3=21593
 from fine wire, kinetic theory 3=1848
 fins, triangular, temp. distrib. and heat flow 3=3908
 from Na, molten, in staggered tube bank cross-flow 3=16816
 flow in pipes, turbulent, theory 3=5411
 flow over wedges, boundary layer solns. 3=5409
 fluid flow in smooth tubes 3=7180
 fluidized beds, solid particles and gas 3=7184
 fluid and assembly of particles, heat and mass transfer 3=3906
 fluid moving layers with dispersed solid material, equations 3=11967
 fluids, calc. substitution separation method 3=14393
 gas, dissociating, in laminar boundary layer 3=18854
 gas, rarefied, using Monte Carlo method 3=1730
 harmonically coupled particle chain 3=7132
 heat-exchanger plate, var. of temp. and transfer coeff. over plate 3=14394
 heat and mass transfer during drying 3=1866
 heat pump, thermoelec., surface effect 3=8575
 increase by transverse vibrations 3=5545
 inhomogeneous bodies, calc. substitution separation method 3=14393
 insulating liquids, and charge carriers 3=14148
 interface, directional effect, rel. to thermal comparator 3=272
 interface of two independently-stirred liquids 3=24077
 irreversibility of process, entropy change 3=24075
 Kapitza resistance of Sn, In and sapphire 3=311
 laminar flow, energy transfer 3=7176
 laminar natural convection flow, porous walls 3=99
 linear, with motion of boundary, calc. 3=11974
 liquid evaporation 3=299
 liquid suspension, critical equation 3=19039
 liquids, thermal diffusion, inertial effects theory 3=16608
 liquids, in turbulent flow at large Prandtl numbers 3=18791
 literature review from recent research 3=275
 local velocity profile in boundary layer near non-uniformly heated plate 3=11755
 metal-liquid, Kapitza temp. jump, effect of cond. electrons 3=15451
 metal-metal interface, directional effects, theory 3=1846
 metal-superfluid He boundary 3=5570
 nitrogen, stagnation-pt., ionization effects 3=18853
 n-pentane, pool-boiling meas. 3=298
 from plate, in forced turbulent air flow 3=19036
 plate heated on one surface 3=24087
 powders, intensively outgassed 3=3907
 quasi-linear heat and mass transfer 3=24072-3
 radiation, between specularly refl. plates 3=7381
 radiation, configuration problem method 3=287
 radiation, in homog. sphere with central source 3=19061
 radiative, in finite grey atmosphere 3=21267
 review of work in 1962 3=24071
 similarity integrals for heat and mass transfer 3=1847
 from single spheres in low Reynolds no. slip flow 3=19038
 snow, ventilated, by vapour transfer 3=11979
 solid grains to flowing gas 3=11966

Heat transfer — contd

- Spalding function, extensive calc. 3=11970
 stagnation-point flow, mag. field effect 3=273
 along streamlined plate, in forced turbulent air flow 3=19033
 surfaces, rough 3=16817
 thermal boundary layer, optical models 3=24076
 thermal diffusion in rod, teaching expt. 3=11964
 thermal diffusivity, flash method, heat loss effect 3=21581
 thermal diffusivity, meas. by flash-method, temp. and finite pulse-time effects 3=16819
 thermal diffusivity meas. at high temps. 3=9634
 thermal diffusivity, meas., heat-wave methods 3=16818
 in transformer oil, transient phenomena 3=11965
 turbulent, in circular tube 3=19035
 in turbulent gas flow, effect of gas-injection 3=23919
 turbulent field, velocity rel. to temp. 3=11969
 in turbulent flow 3=7186
 unilateral, liquid metals flowing in annuli 3=7366
 viscous gas flows 3=24122
 W surface, 1710-2500°K, in cold gases 3=24078
 Ar arcs, high-intensity, anode 3=7483
 CO₂ near critical pt. 3=21589
 H₂, liquid, thermal exchange coeffs., forced convection 3=16605
 He, boiling 3=9671
 He II, turbulence when heat current applied 3=21642
 Na, liq., in metallic tubes, meas. 3=3909
- Heat treatment**
 alkali halide crystals, irradiated, rel. to stress/strain relationships 3=22649
 alkali halides, Cu impurities penetration of lattice 3=6667
 annealing furnace, electron cloud 3=5136
 brasses, and elec. resistivity, abnormal, criticism of conclusions 3=15535
 bronzes, Al and elec. resistivity, abnormal, criticism, of conclusions 3=15535
 chlorophacite, effect on mag. props. 3=1499
 eutectic, quenched ideally, degree of non-equilib. 3=13533
 ferromagnet, rel. to Barkhausen noise 3=3104
 glasses, photosensitive, X-ray effects 3=8478
 glass, rel. to toughening 3=3229
 graphite, annealing, rel. to neutron irradi., e.s.r. study 3=22867
 graphite, electron irradi. effects, annealing 3=10615
 graphite, quenching and annealing, dislocation loops 3=4861
 graphite, rel. to dislocation loops 3=17741
 graphite, vacancy loops, rel. to annealing 3=17705
 Invar, isothermal holding, magnetodiffusion effect 3=3216
 ionic crystals, Rn²²² and Xe¹³³ labels, release 3=823
 iron, carbonyl powders, effects on crystal structure 3=20873
 magnetic, rotary field, anisotropy prod. in Ni ferrite 3=15892
 metals, f.c.c., annealing rel. to Bordoni peaks 3=23298
 metals, point-defect annealing, theory 3=22727
 Nimonic-type alloys, ageing rel. to structure changes 3=16113
 noble metals, recovery 3=23345
 phosphates, neutron irradi. annealing 3=22872
 powdered solids, shock-excited, spectroscopy 3=24018
 quenching, Ni-Co alloys, effect on magnetic annealing 3=8681
 quenching, 20 000 deg C sec⁻¹, microscopy 3=18683
 quartz, annealing of X-ray damage 3=6555
 solid solns., quenching defects 3=8909
 steel, case-hardened layer, substructure 3=1247
 steel, destructive fatigue elimination 3=25643
 steel, extra-soft, quenching and ageing effects 3=16111
 steel, transformer, 2-4% Si, carbide formation and coercive force 3=16101
 steel, Type E310, mag., effect of field on hysteresis and mag. curve 3=20584
 steels, austenitic, rel. to NbC precip. 3=18359
 U-10 steel, quenched, tempered, lattice distortions 3=16106
 transition metals, rel. to embrittlement 3=8784
 Zircaloy-2, recovery after annealing 3=11170
 Ag annealing of dislocations 3=22779

Heat treatment—contd

- Ag, cold-worked, stored energy release on annealing 3=11173
 Ag thin films, rel. to optical properties 3=13146
 Ag, wires, rel. to internal friction peaks 3=18166
 AgBr:Ni, bleaching 3=13187
 AgCd, order—disorder transformations 3=3328
 Al alloys, annealing of radiation damage 3=22860
 Al, annealing of radiation damage 3=22860
 Al, annealing, recrystallization and polygonization 3=3335
 Al, deuteron irradi., isothermal annealing 3=13021
 Al, polycrystalline, rel. to Hall field and resistivity, 20°K 3=4907
 Al, quenched, aged defects 3=10667
 Al, quenching, temp., effect on internal friction 3=15976
 Al sheet, rolled, annealed, hardness anisotropy 3=3246
 AlAgCu alloy prep. by strain-anneal method 3=23394
 Al—Cu, Guinier—Preston zones 3=8876
 Al—Mg—Si sheet, recrystallization 3=6869
 Al₂O₃, with 1 wt.%Zr, dislocations after annealing 3=12976
 Al—Si, quenched, pptn. nuclei concn. 3=18355
 Au, annealing after quenching, aggregate vacancies 3=4864
 Au, deuteron irradi., isothermal annealing 3=13021
 Au, neutron irradi., isochronal annealing 3=2848
 Au, thin films, rel. to optical properties 3=13146
 Au—0.25 at % Hg, neutron irradi., annealing 3=2848
 Au—Ag alloys, conductivity, electrical, changes due to ordering 3=22894
 Be, commercial, structural changes 3=11290
 BeO, irradiated, He diffusion, from specific heat, below 4°K 3=15509
 Bi₂Te₃, point defects, thermal annealing 3=22712
 C, pyro, diamagnetic props. and crystal structure 3=20949
 Cd, thermal cycling, elec., mechanical props. 3=3233
 CdS, annealing, effect on real structure 3=11262
 CdS, rel. to photosensitivity and luminescence 3=17954
 Cd—Sn alloy, density variation under thermal cycling, to 250°C 3=6868
 Cd—Zn alloy density variation under thermal cycling, to 250°C 3=6868
 Co—Ni—P, effect on fine-particle structure and mag. props. 3=16097
 Co—P alloys, effect on fine particle structure and mag. props. 3=16097
 Cr₂O₃, paramagnetic reson. absorpt., 15 times reduction by heating at 1000°C 3=20643
 CsCl-type alloys, annealing of quenched-in defects 3=22715
 Cu alloys, annealing of radiation damage 3=22860
 Cu, annealed, defect prod. by deformation 3=11154
 Cu, annealing after irradi. hardening, recovery 3=20721
 Cu, annealing of radiation damage 3=22860
 Cu, annealing, structural changes 3=20945
 Cu, cold-worked, stored energy release on annealing 3=11173
 Cu, quench-hardening and resoftening 3=8907
 Cu, quenching to study lattice defects 3=15481
 Cu, rel. to dislocation etch pit study 3=22788
 Cu, rel. to polygonization 3=20897
 Cu, stage I annealing, rel. to electron irradi. energy 3=8468
 Cu—Al alloy, constitution, quenching effect 3=20868
 Cu—Al alloy, elastic limit anisotropy 3=11143
 Cu—Al alloy, ordering, rel. to quenching temp. 3=18349
 Cu₃Au, relaxation of long-range order parameter 3=20889
 Cu₃Au alloy, elec. props. rel. to ordering 3=3330
 Cu₃Au alloy, Hall effect rel. to ordering 3=3331
 Cu—Be alloys, structural hardening 3=1349
 Cu—Si—(Mn) alloys, rel. to atomic rearrangements 3=22701
 Cu, thin films, rel. to optical properties 3=13146
 CuO—Fe₂O₃, rel. to ferrimag. props. 3=18104
 Cu—Ni films, annealing, effect on submicro-porosity 3=23510
 Fe alloys, annealing, effect on crystal structure 3=8903
 Fe, annealing of neutron irradiation damage 3=8759
 α -Fe, annealing with C 3=23484
 Fe, rel. to ductility 3=13349
 Fe single crystal production by δ range heating 3=13420
 Fe—Al, quenched, annealed, elec. cond. 3=3327
 Fe—3.8% Au solid solution, Guinier—Preston zones 3=8882

Heat treatment—contd

- Fe—C alloys, α -tempered, carbide pptn. 3=13539
 Fe—C alloys, quench-aged, structure 3=20903
 Fe—N alloys, quench-aged, structure 3=20903
 Fe—Ni alloys, annealing of irradi. defects, rel. to magnetization 3=22729
 Fe—Ni—Cr—Ti system, quenched, χ -phase 3=3314
 Fe(50%)—Ni(50%), annealing of defects, rel. to neutron irradi. 3=11056
 Fe—3%Si, directional ordering by magnetic annealing 3=15804
 GaAs, annealing, rel. to length changes 3=22861
 GaAs, rel. to paramagnetic resonance centres in high concentrations 3=20647
 GaAs : Se, electron conc. changes, 650–1100°C 3=22945
 GaAs : Te, electron conc. changes, 650–1100°C 3=22945
 Ge, annealing of mono-crystals, effect on dislocations 3=6516
 Ge, n-type, γ -irradi., annealing stages 3=25313
 Ge, rel. to domain formation 3=17772
 InSb, annealing, rel. to length changes 3=22861
 InSb, yield drop rel. to heating in O₂ 3=13353
 KCl : Ag, X-irradi., annealing 3=5044
 KCl, F-aggregate centres, thermal prod. 3=4891
 KCl, hardening by quenching 3=16008
 K₂CrO₄, neutron irradi. annealing 3=22871
 K₂CrO₄, thermal neutron capture, compression annealing 3=25311
 Li₂CrO₄, n-irradiated, defect annealing kinetics 3=17700
 Mg, thermal cycling, elec., mechanical props. 3=3233
 Mg, vacancies, formation and activation energies and mobility 3=25269
 MgO, annealing after cold working 3=25277
 MgO, rel. to point defects 3=22717
 Mg—Zr, in H₂, creep ductility improvement 3=25763
 Mn_{1.16}Fe_{1.84}O₄, elec. props. 3=22949
 Mo, n-irradiated, hardening, \geq 500°C 3=20730
 Mo, vacancy annihilation after neutron irradi. 3=2787
 Mo—Re alloys, annealing, rel. to dislocations 3=22781
 NaCl, annealing, rel. to dislocations 3=17757
 NaCl : Pb, activator absorpt. spectrum 3=940
 Nb—Zr alloys, and superconductivity 3=19115
 Ni alloys with Ce, Pr and Cd, annealing coercive force 3=23159
 Ni, annealing, in moist H₂, removal of anomalous mech. props. 3=20722
 Ni, cold-worked, stored energy release on annealing 3=11173
 Ni, effect on grain structure, strength 3=3234
 Ni, influence on coercive force 3=11059
 Ni, long-term strength after hot work-hardening 3=8778
 Ni, point defect clustering 3=22721
 Ni, tempering, temp. between cylinder centre and surface 3=9641
 Ni ammonium salts, recovery from n-irradi. 3=8472
 Ni—Be alloy, ageing, structure changes 3=13507
 Ni_{1-x}Co_xFe₂O₄, annealed, mag. anisotropy 3=1033
 Ni—Cr alloys, rel. to tensile strength increase 3=25637
 Ni—Cr base alloy, fine structure and mech. props. 3=18351
 Ni—Fe, annealing, twin growth and origin 3=25756
 Ni, Fe, and magnetic anisotropy 3=23155
 Ni—Fe films, rel. to magnetic properties 3=18083
 Ni₃Fe—(3%)Mo, quenching in air and water rel. to K-state formation 3=13531
 Ni₃Pt, effect on short-range order, microhardness and characteristic temp. 3=8906
 Ni—Zn—Co ferrite, annealing in mag. field 3=3130
 Ni—Zr, superconducting crit. current, effect of annealing temp. 3=14460
 PbSe, rel. to controlled deviation from stoichiometry 3=22736
 PbTe, X-ray diffr. study 3=18203
 Pt, wires, rel. to internal friction peaks 3=18166
 Pu, annealing of self-damage 3=22856
 S, purple, annealing, e.s.r. study 3=20655
 Si, annealing of radiation damage 3=15581
 Si, annealing of radiation defects 3=22934
 Si, effect of structural defects after electron irradi. 3=22764

Heat treatment—contd

- Si, electrical conductivity changes 3=15579
- Si, P-doped, n-type, Ni^{3+}Cl coated 3=6537
- Si, rel. to carrier lifetime^a 3=22933
- Si, semiconducting recomb. centre prod., by quenching, 960–1200°C 3=22932
- Si-Fe, sheet, transformer, effect on mag. props. and recrystallization texture 3=16098
- Ti-Cr alloy, effect on structure and hardness 3=20879
- U, irradiation growth 3=8480
- α -U, incremental collapse while undergoing creep 3=8908
- U-Mo alloy, γ -quenched, annealing 3=5135
- V, effect on hardness and grain size 3=5137
- W, cast, effect on mech. props. and structure 3=11183
- W, stress/strain relations, temp. effects 3=23307
- Zn density variation under thermal cycling, to 250°C 3=6868
- Zn, thermal cycling, elec., mechanical props. 3=3233
- ZnS, luminescence quenching 3=4987
- Zr-2.5 wt% Nb, hardness 3=1234

Heating

- annealing furnace, electron cloud 3=5136
- arc, electric, sample in electrode, chemical reaction effects 3=24257
- atmosphere, radiative heating-rate 3=11393
- body by radiant heat, surface heat flow 3=24099
- flash heating, W vaporization, near u.v. spectroscopy 3=24117
- furnace, for spectroscopy of low-volatile cpds. 3=1817
- furnace, solar or arc imaging, use of light pipes for redistrib. radiation 3=19056
- gas by radiation 3=1855
- heat pump, thermoelec., theory 3=8575
- liquids, effect of ionic currents 3=24074
- metal filaments, controlled flash 3=7379
- nichrome wire, in centre of glass pipe, water cooled, burnout 3=9661
- ohmic, by condenser discharge over plasma column 3=7600
- plasma, by trapping polarized r.f. in pulsed mirror field 3=9783
- rate proportional to square of abs. temp., apparatus 3=3917

Height measurement

See Altimeters; Length measurement.

Helium

- adsorption in ionization gauge 3=16669
- afterglow, spectroscopic meas. 3=4105
- afterglow, short and visible, obs. 3=24235
- afterglow, very early 3=4065
- atmosphere, upper, λ 10830 excitation 3=13789
- atom, atomic scatt. factors calc. 3=25703
- atom, conjugated, π orbital, doubly occupied, correl. energy 3=22576
- atom, electron correl., exactly soluble model 3=4703
- atom, electron excited, light polariz., mag. field depend. 3=6362
- atom, electron scatt. at zero energy 3=10475
- atom, excitation by electrons, polarized light 3=8209
- atom, fifth-order wave function 3=4706
- atom and He II, resonance lines 3=14355
- atom, inelastic scatt. with H_2 mol. 3=17623
- atom, interaction energy with H_2 mol. 3=17622
- atom ($1s^2$), electron capture by protons 3=15304
- atom, optical radiation due to electron impact 3=8208
- atom, relative optical excitation functions 3=12778
- atom, spectral line blackening in hollow cathode 3=19936
- atom, $(2p^2)^3\text{P}$, quasi-stationary states 3=2554
- atom, 2^3S state, config. interaction method 3=25046
- atom, X-ray scatt. factors, Schwartz method 3=10445
- atoms, collision of two, Born approx. calc. 3=710
- atoms, correlation energies of excited states 3=4704
- atoms, diamag. susceptibility, calc. 3=19929
- atoms, elastic scatt. of electrons, resonance 3=15300
- atoms, electron polarization interaction 3=713
- atoms, excitation, double, by e impact 3=19951
- atoms, excitation by p and d impact, 40–200 keV 3=8199
- atoms, excitation in solar chromosphere 3=13889
- atoms, ground state, wave-function expansion 3=25045
- atoms, $\text{H}^+ + \text{He} \rightarrow \text{H} + \text{He}^+$, 0.025–1 MeV protons 3=14518
- atoms, metastable, deactivation by proton impact, up to 16000°K 3=4718
- atoms, S-states, variational calc. 3=22471

Helium—contd

- atoms, two-electron transitions to autoionizing states 3=19927
- atoms, two-electron transitions to autoionizing states 3=19928
- in betatron, electron loss by scatt. 3=459
- breakdown, 10^{-6} mm press., using secondary electrons 3=4090
- collisions with light element ($Z=2$ to 18) ions, electron loss 3=7448
- dense gas, polarizability change due to many-body interact. 3=1705
- diamag. susceptibility calc. 3=6348
- diffusion of He^4 - He^3 in pure He, thermal 3=14203
- diffusion with HT, DT, T_2 , thermal 3=21430
- diffusion, into Kr, through porous materials, separation 3=9491
- diffusion in Li halides, after n. irradiation 3=15508
- diffusion, thermal, He^3/He^4 meas. 3=11823
- diffusion in Xe, thermal, calc. 3=7233
- diffusion, thermal, quantum diffr. effects 3=21431
- discharge, electric, positive column, helical instability, in mag. field 3=16915
- discharge, e.m. radiation, 35 and 10 kMc/s, rel. to mag. field 3=4031
- discharge, pulsed, light characteristics rel. to external mag. fld. 3=1959
- discharge, vacuum u.v. spectra 3=7462
- effect on recrystallization and grain-boundary motion in Al 3=11222
- elec. discharge, positive column, Hall effect 3=4036
- elec. discharge, shock waves, magnetically driven 3=7278
- electron diffusion—mobility coeffs. ratio 3=4023
- electron scatt. by gas, atomic excitation 3=25066
- electron scatt., induced radiation, polarization 3=17543
- electron scattering, sharp resonance at 72° of 19.3 eV 3=10474
- ion beam on W, photon prod., 25–100 eV 3=21900
- ion emission, field 3=19371
- ion, $\text{He}^{2+} + \text{H}(1s) \rightarrow \text{He}^+(2s \text{ or } 2p) + \text{H}^+$, theory 3=9732
- ionization ahead of cylindrical shock waves 3=1759
- ionization by protons, 0.15–1.1 MeV 3=4006
- ionization, by ruby laser 3=19170
- ionized atoms, escape mechanism from atmos. 3=13692
- in ionosphere 3=9072
- ions, bombardment effects in Si 3=10708
- ions, electron capture in H_2 , He, A, N_2 , Kr 3=5631
- ions, energy loss and effective charge in gases at < 10 MeV/a.m.u. 3=1937
- ions, He^+ , charge transfer to O_2 and N_2 3=24224
- ions, He^+ , collisions with H_2 , prod. of Lyman- α radiation 3=6366
- ions, He^+ , ionization cross-sect. meas. 3=7425
- ions, He^{2+} -He charge exchange, resonant 3=16909
- ions, He_2 + prod., in mass spectrometer, var. with electron energy 3=14523
- ions, single exosphere, distrib., 1500, 2000°K 3=16240
- in metal films, migration and coalescence 3=25314
- molecular beams, clustered, prodn. 3=2678
- orthopositronium, pick-off quenching 3=2252
- photo-ionization 3=25047
- pinch discharge, linear, spectroscopic meas. 3=7559
- planets, radiation, scattered solar HeI, obs. possibility 3=16343
- plasma, cold, negative radiation temperature 3=9787
- plasma, collision-dominated, spectra 3=7506
- plasma, decay in mag. field 3=14591-2
- plasma, decaying, ionization processes 3=14517
- plasma, in theta pinch, electron temp. meas. 3=12142
- plasma, ion recombination in mag. field 3=14603
- plasma, ionic recombination 3=4106
- plasma, optically thick in red, i.r. 3=16924
- plasma, optically thin, temp. and density meas., spectral meths 3=7577
- plasma oscillations, frequency det. 3=2004
- plasma, radiation temperature resonances, r.f. meas. 3=4121
- powerful impulsive discharges, electron energy meas. 3=7452

Helium—contd

- prod. from air decomposition plant 3=16472
 production and use 3=16471
 radiation due to electron impact, polarization 3=4719
 reactions with H_2 and H_2^+ 3=11342
 shock waves, rel. to intermol. force laws 3=1755
 shock waves, electron densities and temps. 3=1752
 shock wave, equilibrium state behind 3=16698
 shocks, compression, e.m. driven, prod. and props. 3=7276
 solubility in H, temp. correction 3=24112
 specific heats behind strong shock front 3=16699
 spectrum, emission, 1.6-3.7 μ 3=15281
 spectrum, continuous, vacuum u.v. 3=7246
 stopping cross-section for 40-250 keV protons 3=22133
 thermal transpiration, 10⁻⁸-20 torr 3=18844
 viscosity meas., oscillating disc. method 3=14189
 He³ abundance on sun 3=7032
 He⁻ beam prodn. 3=7650
 He₂⁺, binding energy, new lower limit 3=723
 He-burning reaction products in stars 3=11563
 He⁺ collisions on O₂ 3=21707
 He^{3,4}, in lower thermosphere, lifetimes, thermal diffusion and escape rates 3=5209
 He³ nucleus, radius, Coulomb energy 3=12519
 He⁴, 2nd virial coeff., high temp. 3=21440
 He II arc discharge, spectral line broadening 3=4069
 He³, three-body bound state, binding energy 3=25109
 HeII spark spectra in low-press. plasma 3=7609
 He—Cs plasma, microwave diagnostics, up to 3000°K 3=4135
 He—He Rosen interaction potential 3=10507
 He—He, united-atom configuration-interaction 3=10508
 He³, He⁴ and He⁺, Lamb shifts 3=7328
 He²⁺ + He⁺(1s) → He⁺(1s) + He³⁺, calc. 3=1938
 He⁺, ionization by electron impact, calc. 3=14519
 He₂⁺, wavefunctions 3=12806
 He—Li⁺ interaction, 5 to 25 keV 3=4005
 He—N₂ mixtures, compressibility and 2nd virial coeff. 3=14192
 He—O, afterglow, electron removal 3=4064
 He⁴, third virial coeff., quantum calc. 3=14206

gas

- afterglow discharge, probe studies 3=7440
 diffusion of Kr⁸⁵ in dense gas 3=1720
 flow, free-molecular, momentum transfer to metal surfaces 3=5456
 gas, electrical conductivity 3=11840
 gas, ionized, rarefied, charge-carrier diffusion 3=16906
 gas, ionization growth times and secondary processes 3=9725
 gas, ionization by 100 keV protons 3=19177
 gas, u.s. vel. meas., 3.5 Mc/s at 3500 atm 3=1728
 gas, viscosity, -78.5° to 100°C, below 200 atm 3=7223
 gasifier for obtaining pressures up to 100 atm. at low temps. 3=12013
 mixtures with O₂ and N₂, rotational relax. 3=6431
 sound attenuation, in rarefied gas 3=5466
 viscosity and thermal cond. of mixtures with A and Ne. 3=168
 He³, n.m.r., self-diffusion and spin-lattice relaxation, 1.7-4.2°K 3=178
 He⁴, properties near critical temperature 3=9669
 He—Ne continuous laser, near i.r. props. 3=7317
 He—Ne gas maser, optical output 3=525
 He—Ne gas masers with external mirrors 3=9985
 He/Ne laser, intensity, var. with pressure and relative conc. 3=14805
 He—Ne laser, spectral line shape 3=11908
 He—Ne, maser, optical, new transition, on dominance removal 3=17090
 He—Ne, maser, optical, power output, varying plasma length and discharge current 3=17087
 He—Ne maser, optical, enhancement during afterglow 3=14801
 He—Ne maser, optical, saturation at 3.39 μ 3=19497
 He—Ne mixtures, laser effect transitions 3=22475
 He—Ne planar laser, Zeeman effects 3=2145
 He—Ne 2s—2p transitions in laser 3=6358
 He—Xe maser, optical, 2.026 μ , Zeeman tuning 3=17076

Helium—contd

liquid

- See also Quantum theory, many-particle systems; Superfluidity.
 boiling, film, at heated plates 3=21643
 boiling, heat transfer 3=9671
 equation of state, isotopes, universal, including quantum effects 3=21321
 fermion liquid theory, applications 3=77
 friction between superfluid and normal components 3=5571
 Kapitza resistance of Sn, In and sapphire 3=311
 level indicator, dielectric 3=21648
 liquefier, using cascade compression 3=5560
 low-temp. conference, Kiev, Oct. 1961, papers included 3=24124
 λ -point, lowering, in thin films and narrow channels 3=5561
 momentum distrib. and excitation spectrum 3=21647
 motion of charges 3=316
 oscillations, torsional, theory 3=19090
 positron annihil. in liq. and solid 3=17254
 quantum phases, off-diagonal long-range order 3=14436
 relaxation processes, hard-sphere model 3=309
 rotating, uniformly, mutual friction, axial component 3=19087
 rotation, central vortex formation meas. 3=21646
 specific heat in crit. region, theory 3=18751
 superfluid, temp. discontinuity at metal boundary 3=5570
 superfluidity, kinetics of destruction 3=1884
 temperature regulator, to $\pm 10\mu$ deg 3=24128
 vapour press. thermometer, errors 3=19082
 HeII, β -irrad., ionic currents 3=5562
 He II, critical velocity, rel. to vortex ring energy 3=3938
 He II, crit. velo. and vortex rings, quantum calc. 3=19092
 He II, diffusion of He³, theory 3=19088
 He II, electrohydrodynamics in narrow channels 3=312
 He II, entropy production and heat flow 3=21641
 He II, evaporation, vapour velocity near surface 3=1883
 He II, film flow at low pressure heads 3=313
 He II film, thickness when moving 3=19084
 He II, flow under large temp. and press. grads 3=7398
 He II, fluctuations, anomalous, on passage of ions 3=16850
 He II, free surface in rotation, obs. 3=19083
 He II, friction between superfluid and normal components 3=21645
 He II, heat conduction in capillaries 3=310
 He II, luminescence, due to 5.3 MeV α 's, inhibition below λ point 3=21644
 He II, mutual-friction, growth 3=21642
 HeII quantum periodicity in transition temp. 3=14067
 He II, rotating, near λ -point 3=16851
 HeII, spectrum, energy, elementary excitations 3=5566
 He II, Van Hove correl. functions 3=11703
 HeII, viscosity bet. 0.79°K and λ point 3=14434
 He II, thermal cond., channel geom. effects 3=24130
 He II, theory using internal cohesion 3=24129
 He II—He³ mixtures, diffusion data analysis 3=1881
 He³, adsorbed, n.m.r., 2°—4.2°K, extension 3=19091
 He³, electronic and ionic motion 3=1677
 He³, liquid—solid transform. anomalous 3=3937
 He³, liquid-solid mixture at press. near melting-curve minimum 3=314
 He³, molar volume and expansion coeff. 3=5563
 He⁴, near λ curve, compress. and press. coeff. 3=12018
 He³, nuclear susceptibility under pressure 3=1882
 He³, osmotic pressure in liq. He⁴, refrigerator for <1°K 3=5565
 He⁴, osmotic pressure of He³ in, refrigerator for <1°K 3=5565
 He⁴, properties near critical temperature 3=9669
 He³, properties rel. to melting curve 3=14437
 He⁴, simple and generalized condensation 3=1635
 He³, specific heat and thermal expansion 3=12016
 He³, specific heat, 0.054—0.3°K, no superfluid transition 3=5564
 He³, spin—lattice relax. and self-diffusion 3=19085
 He³, spin waves and paramagnetic relaxation, Fermi liquid model 3=14435
 He³, transition to superfluid state 3=5569

Helium — contd**liquid — contd**

- He³ viscosity 0.14–2.1°K meas. 3=16849
 He³ and He⁴ I, electronic and ionic mobility, theory 3=317
 He³–He⁴ mixtures, nuclear spins ordering 3=315
 He⁴ + He³ mixture, single particle and collective excitations 3=14060
 He³–He⁴ mixtures, statistical mech. 3=19086
 He³–He⁴, phase equilibrium with solid, 1.5° to 4.2°K 3=16854
 He³–He⁴ soln., λ -pt. equilib. diag. 3=5568
 He³–He⁴ solns., surface tension 3=24131
 He³–He⁴ solns., thermal cond. and diffusion, λ -point to 0.6°K 3=3939
 He³–He⁴ solns., λ -transition point 3=5567
 He³ and He⁴ solutions, thermodynamics, above λ -temperature 3=19089
 He⁴I, electronic and ion motion 3=1677

liquid, sound propagation

- absorption, rel. to velocity, below λ -point 3=3941
 absorption, zero-boiling point 3=5572
 impedance, down to 0.04°K, He⁴,³ 3=19093
 second sound absorption theory in rotating He 3=12019
 supercritical oscillation conditions 3=16852
 third sound, experimental detection in films 3=318
 velocity, 0.1° to 1.7°K 3=319
 velocity of sound, revised calc. 3=9670
 zero-sound damping macroscopic theory 3=5438
 zero sound, He³, from impedance, 0.09°K 3=19093
 He³–He II, first-sound absorption 3=3943
 HeII, attenuation, collective motion model 3=7140
 HeII, coupling between first and second sound 3=5573
 He II, fourth sound 3=1886
 He II, rel. to interacting bosons theory 3=23802
 He II, second sound atten. in wide capillaries 3=3942
 He II, u.s. atten., quantum hydrodyn. 3=7399
 He II, velocity of "second sound wave", eqn. 3=24129

solid

- α He³, specific heat and self-diffusion 3=8422
 elastic const. calc. from lattice vibrations 3=18158
 equation of state, isotopes, universal, including quantum effects 3=21321
 motion of charges 3=316
 phase transformations hcp–bcc, He³,⁴ 3=16853
 solidification, visual observation 3=324
 He³, adsorbed, n.m.r. 3=12020
 He³, α and β phases, n.m.r. expt. 3=5574
 He³, compressibility to 2×10^4 bar 3=8762
 He³, properties rel. to melting curve 3=14437
 He⁴, compressibility to 2×10^4 bar 3=8762
 He⁴, γ -phase, structure 3=322
 He³,⁴, ground-state energy, Hartree calc. 3=320
 He⁴, lattice thermal cond., theory 3=321
 He⁴ melting curve minimum 3=21649
 He³, solid-liquid mixture at press. near melting-curve minimum 3=314
 He³, specific heat meas. of α and β -phases 3=1887
 He³–He⁴ mixture, phase sepn., sp. ht. meas. 3=323
 He³–He⁴ mixtures, melting curves, minima 3=315
 He³–He⁴, phase equilibrium with liquid, 1.5° to 4.2°K 3=16854
 He⁴, thermal excitations rel. to equil. with liq. He⁴ II 3=1888

Helium compounds

- HeH⁺ molecule ion, ground state 3=12821
 He–H, vapour–liquid equil. and temp. corrs. 3=24112
 HeNe⁺, emission spectrum?, liquid air cooled hollow cathode lamp 3=12822

High-pressure phenomena and effects

- alkali halides, compressibility, shock 3=18179
 alloys, light, mechanical props. 3=18157
 apparatus for electron spin resonance studies 3=24492
 apparatus, Bridgman opposed-anvil, press. multiplication 3=16469
 apparatus, up to 20 kbar and various temp. 3=23333
 chamber for high pressure expts. 3=7078
 cryostat, liquid–He temp. 3=19081
 diamond by direct conversion of graphite in static pressure apparatus 3=8793
 equations of state, rel. to Thomas–Fermi–Dirac atom theory 3=775

High-pressure phenomena and effects — contd

- equipment 3=18157
 friction, teflon, on teflon and steel 3=6808
 glass, silica, high-pressure densification, effects of shear 3=8919
 graphite, melting 3=9656
 graphite, melting point 3=6818
 graphite to diamond conversion, 130 kilobars, 3300°K 3=6819
 helium, gas, gasifier for obtaining pressures up to 100 atm. at low temps. 3=12013
 hydrostatic pres. on remanent magnetization 3=23156
 ice VII, melting curve to 200 kbar 3=9655
 magneto electric effect, metals at low temp. 3=24158
 méas., by use of volume discontinuities, corrections 3=9404
 metallic state, approach to 3=17812
 metals, electron props 3=25218
 nylon, pressure-induced transitions 3=23494
 pentaerythritol, effect on crystal structure 3=3252
 polyethylene, pressure-induced transitions 3=23494
 polymers, organic, semiconducting, piezo-resistance 3=852
 polytetrafluoroethylene, pressure-induced transitions 3=23494
 rubber, pressure-induced transitions 3=23494
 semicond. materials, elec. resistance of high-pressure phases 3=859
 solutions, aq., charge-transfer and transition metal ion spectra 3=1690
 strain meas. tensile, optical silhouette, under high hydrostatic pressure 3=13343
 in tetrahedral anvil device, pres. distrib., hysteresis 3=7168
 transition-metal oxides and sulphides, elec. cond. 3=25370
 Al, fusion curve 3=6814
 α -Al₂O₃, γ -irrad., thermoluminescence 3=23129
 Au, vacancy formation, 400–11000 atm. 3=8430
 Ba, phase transformation, electronic, 50 000–60 000 atm., calc. 3=23372
 BaTiO₃, ferroelectric Curie point reduction 3=22994
 BaTiO₃, structure rel. to hydrostatic pressure up to 600 kg cm⁻² 3=6848
 Bi, polycryst., structure under 20,000 atm. 3=16017
 C, new phase above 150 kbar 3=18229
 CaMgSi₂O₆, diopside, melting curve 3=9657
 CdS, elec. conductivity 3=15588
 CdSe, melting and polymorphic transitions 3=16016
 CdTe, melting and polymorphic transitions 3=16016
 CrVO₄, atomic structure, from X-ray diffr., rutile 3=11270
 Cu, pressure-bonded, interfacial voids 3=16114
 Cu, pure, recrystallization kinetics 3=6866
 Fe, intrinsic magnetization, to 11 000 kg/cm² 3=6700
 Fe, n.m.r. up to 65 000 atm 3=11123
 Fe–C alloys, austenite, isothermal transform. 3= 11286
 FeVO₄, atomic structure, from X-ray diffr. using orthorhombic unit cell 3=11270
 Ga, fusion curve and polymorphic transition 3=6814
 GaAs, spontaneous and stimulated emission 3=25495
 Ge, band structure calc. 3=22682
 Hg, liquid– α and α – β transitions 3=18227
 HgSe, phase transition 3=3253
 HgTe, melting and polymorphic transitions 3=16016
 InAs, effect on elec. props. 3=17886
 InSb, effect on elec. props. 3=17886
 K, elect. resist. at low temps. 3=828
 KBr, phase transformations, from compressibility, shock 3=18179
 KCl, phase transformations, from compressibility, shock 3=18179
 KNO₃, polymorph transition rates 3=20772
 Li, elec. resist. at low temps. 3=828
 LiH, polymorphism, < 6 k bar? 3=8794
 Na, elec. resist. at low temps. 3=828
 NaAlSi₃O₈, albite, melting curve 3=9657
 NaCl, Grtneisen constant 3=4827
 NaCl, inclusion of Cu atoms 3=10651
 NaCl, as pressure-transmitting medium 3=5308
 NaCl, structure change to CsCl-type at 18 000 kg/cm² 3=6811
 NaCl, transf. to cubic CsCl structure 3=16015

High-pressure phenomena and effects—contd

- Ni, intrinsic magnetization, to 11 000 kg/cm² 3=6700
 Ni, saturation magnetostriction to 10⁴ atm 3=1150
 Ni—Zn ferrites, elec. resist., pressure depend. 3=4940
 Pb, polymorphism 3=6863
 Te, plane transformation, liquid to metallic 3=19066
 Th—In phase diagram to 5.5 kbar 3=20886
 Tl, fusion curve and polymorphic transition 3=6814
 Tl, superconducting transition temp. depend. 3=21668
 U, phase transformations, up to 45 kbar 3=8795
 VO, effect on metal-to-insulator transition 3=1254
 V₂O₅, effect on metal-to-insulator transition 3=1254
 Yb, 20–40 kbars, semiconductivity 3=17899
 ZnS, luminescence 3=18035

High-speed photography

See Cinematography; Photography, high-speed.

High temperature production and effects

- calorimetry 3=9648
 flames, cyanogen—ozone, carbon subnitride—oxygen 3=21602
 furnace, arc-image, for Verneuil crystal growth 3=18243
 furnace, for mech. props. study to 2100°C 3=7378
 furnace for semimicro balance 3=5401
 furnace, simple electron beam (>2000°C) 3=9647
 furnace with graphite heater for 3100°C 3=24093
 furnace with oxygen atmos. for 1800°C 3=24094
 image furnace, radiant power control 3=9646
 metal combustion 3=21602
 plasma jets, He, Ar 3=21602
 plasma torch, h.f. 3=7590
 sparks, electric 3=4053
 2200°C inside electron microscope, temp. control 3=25787
 vector magnetization, meas. instrument 3=464

High voltage production

- Cockcroft—Walton machine, voltage stabilizer 3=9882
 stabilizer circuit 3=24165
 transistorized stabilized power supply 0–2000V 3=14481
 voltage breakdown prevention by inclined fields 3=9884

History

- electrons 3=5312
 M.V. Lomonosov, contrib. to 18th cent. physics 3=16484-5
 metre unit of length 3=9316
 Niels Bohr, appreciation 3=13986
 photometry, invention 3=11878
 quantum physics 3=3740
 S.I. Vavilov's work on history and philosophy of science 3=16482
 spectroscopy, extreme u.v. 3=14337
 thermodynamics, nonequilibrium 3=11711
 ultrasonics, role of piezoelectricity 3=14253

Holmium

- atom, in ethyl sulphate, h.f.s. splitting 3=10572
 ferromag. screw struct. and transitions 3=975
 ferromagnetic—antiferromagnetic transition, crit. fld. meas. 3=17022
 lattice parameters, temp. depend. 3=15444
 mag. susceptibility, 300°–1500°K 3=11033
 magnetic structure detm. by neutron diffraction 3=1108
 magnetoelastic properties 3=11091
 magnetostriction, in flds. up to 15000 Oe 3=8680
 magnetostriction, large 3=20550
 magnetostriction, 20.3, 77°K 3=18118
 Ho²⁺, e.s.r. in CaF₂ meas. 3=13301
 Ho³⁺, electron structure, free and in cryst. field 3=8378
 Ho³⁺ in crystalline salts, u.v. absorpt. 3=3008
 Ho³⁺ in soln., near i.r. transitions 3=23885

Holmium compounds

- holmium ethyl sulphate, zero field splitting 3=8600
 solid solution garnet spin arrangement investigation 3=11099
 HoAl₂, mag. moment and Curie pt. 3=991
 HoCo₅, antiferromagnetic props. 3=15731
 HoCo₅, mag. structure 3=8682
 HoD₂, magnetic structure 3=15911
 Ho ethyl sulphate, thermal cond., phonon dispersion 3=10613
 HoFe, garnet, far i.r. absorption spectrum 3=15680
 HoFeO₃, magnetic domains by Kerr effect 3=18103
 HoIr₂, mag. structure, by neutron diffr. 3=23185
 HoMn₂, antiferromagnetic props. 3=15910

Holmium compounds — contd

- HoN, ferromag. resonance, model 3=13292
 HoN, temp. depend. of spontaneous mag. 3=13245
 Ho₂O₃, neutron scatt., energy distrib. 3=743
 Ho₂O₃, specific heat and thermodyn. props. 3=20106

Humidity

See also Atmosphere, humidity; Hygrometers; Moisture.

measurement devices 3=1573-4

Hydrodynamics

See also Flow, liquids; Jets; Liquid oscillations; Liquid waves; Magnetohydrodynamics; Viscosity, liquids.

- acoustic—gravity waves, rel. to elasticity theory under initial stress 3=18781
 acoustical equations, integration 3=23917
 adiabatic jets, Howard's circle theorem 3=21294
 boundary layer, laminar, rotating sphere, in non-Newtonian fluid 3=9409
 boundary layers, three dimensional 3=9415
 compressible fluid flow, theory of characteristics 3=98
 cosmic-ray showers, two-centre model 3=6107
 cylinder, expanding; resulting fluid motion 3=107
 dimensional analysis, use of governing eqns. 3=16578
 "dynamalpy" tensor, definitions, applications 3=14102
 equations, rel. to elastic collisions 3=7497
 explosion at surface of liquid 3=118
 explosion at surface of liquid 3=5422
 fluid-displacement eqns. for acoustic-gravity waves 3=16581
 fluid, rotating polytropic 3=16577
 forced oscillations in a rotating liquid 3=9428
 gravitational instability, infinite cylinder, surface disturbances 3=23698
 gravity waves, in circular cylinder 3=14123
 incompressible viscous fluid, Lagrangian eqn. 3=16588
 laminar flow, dispersal theory 3=23847-8
 liquid phase boundary under conditions of material transfer 3=3800
 liquid, rotating, surface profile 3=23845
 Maclaurin spheroid, viscous, stability to oscillations 3=14117
 Navier—Stokes eqn., linearized, complete soln. 3=23836
 non-Newtonian, boundary layer 3=23832
 non-relativistic, mass-tensor uniqueness 3=1665
 oscillating fluid, behaviour of particles 3=7181
 relativistic, derivation from transport equation 3=18758
 rotating sphere in fluid flow, thermal boundary layer 3=11766
 rotation bet. coaxial cylinders 3=110
 rotation of sphere in viscous liquid 3=23839
 rotation, steady plane fronts 3=16583
 similarity integrals for heat and mass transfer 3=1847
 sphere rotating in non-Newtonian viscous liquid 3=111
 stability enhancement by modulation 3=1664
 stability, non-linear partial differential equations, analysis 3=18779
 stability of rotating liquid column 3=1666
 stratified fluid, flows and fronts 3=9411
 sun, corona models, and solar wind 3=16390-91
 supersonic shear flow, boundary layer 3=21298
 thermal stability of fluid layer 3=9417
 thermohydrodynamic eqns. soln. for weather forecast 3=1427
 3-dimensional turbulent boundary layers 3=21299
 transformations of eqns. 3=21293
 transition reversal rel. to Tollmien—Schlichting instab. 3=9414
 turbulent layers, stability of homog. structure 3=3787
 two fluids inside porous medium, movement 3=16579
 two spheres, in contact, motion in incompressible homogeneous non-viscous fluid 3=9410
 two spheres falling in viscous medium, collision efficiencies 3=23844
 variational principles for acoustic—gravity waves 3=18780
 vortex street development, numerical soln. 3=18782
 vorticity equations, transformations, by identity system 3=16592

Hydrodynamics — contd

- waves, internal, inhomogeneous fluid 3=18784
He II, u.s. atten., quantum hydrodyn. 3=7399

Hydrogen

- See also Deuterium; Protons and antiprotons; Tritium.
adsorption on NiO, depletive 3=25781
adsorption on Si, i.r. internal reflection study 3=18397
adsorption on W, rel. to surface features 3=3369
adsorptn. on carbon black 3=1377
antiproton annihil. at 1.61 BeV/c 3=19634
atmosphere, outer, distribution 3=13788
atom, Balmer emissions, by proton impact on H₂ 3=15278
atom, Balmer emissions due to H₂⁺ and H₃⁺-H₂ collisions 3=25043
atom beam, electron interchange with molecules 3=6342
atom, coherent scattering of light, calc. 3=4715
atom, elastic electron scatt., phase shifts 3=8210
atom, electron and positron scatt., 11.0-54.4 eV, close coupling approx. 3=8211
atom-electron scatt. cross-sections 3=22503
atom, electron scatt., resonances calc. 3=22508
atom-electron scatt., using hypervirial theorem 3=22500
atom-electron system, total wave-function 3=22501
atom, excitation 1S-2S by electron impact, calc. 3=22506
atom, inelastic electron scatt., calc. 3=10473
atom, metastable state, excitation by fast protons 3=4716
atom recomb. kinetics at 1072°K 3=6426
atom recombination, ionic catalysis 3=16164
atom, resonance lines in extreme u.v. 3=14355
atom, spectral discontinuity, mean optical depth of formation and line strength n series limit 3=25041
atom, spectral line blackening in hollow cathode 3=19936
atom, Stark-broadened Balmer line profiles 3=8176
atom, 2s and 2p level excitation by slow-electrons 3=15298
atom, wave-functions, Gaussian expansion 3=25042
atomic beam, neutral, prodn. from H₂⁺ ions 3=2585
atomic beam prod., 20 keV 3=25070
atomic beam prod. in metastable state 2S 3=2584
atomic, electron impact ionization 3=12073
atomic, reaction with 1-C¹³-propane 3=20989
atomic, recombination and heat of absorption on Al surface 3=25780
atomic recombination, by e.s.r. 3=25068-9
atomic, structure of shock front 3=21491
atoms, catalysis of gas-phase recombination at high temp. 3=16165
atoms, collisions with nuclei 3=4701
atoms, electron capture by protons 3=12781
atoms, electron polarization interaction 3=713
atoms, electron scatt., meas. by elec. cond. method 3=6360
atoms, electron scatt., spin exchange 3=15299
atoms, electron scattering and excitation, rel. to strong bond and exchange 3=10472
atoms, excitation by electrons 3=15297
atoms, excitation by electrons, linear Stark effect, cross-sections 3=25044
atoms, excited by synchr. radiation in stars 3=11569-70
atoms, inelastic scattering of electrons and protons 3=4721
atoms, ionization by electrons, distortion of incident s-wave 3=10466
atoms, production in excited 2S state 3=4717
atoms, recombination, on Pt surface 3=20987
atoms, res. charge exchange 3=6361
atoms, in thermosphere, vertical distrib. 3=5209
Balmer emission lines, in solar prominences, intensities and profiles 3=5260
beams, neutral, energetic, inverted cascades 3=12076
in betatron, electron loss by scatt. 3=459
bonds, C¹³-H, effect of substitution, methanes 3=20001
bonds, halide anions as proton acceptors 3=17566
bonds, in organic molcs., vibration, by i.r. spectroscopy, proposed study 3=6378
breakdown, 10⁻⁸ mm press., using secondary electrons 3=4090
catalysis and adsorption on Ge films 3=3397
chemisorption on Co 3=5163
chemisorption on NiO after neutron irradi. 3=3366
compressibility, quantum hard-sphere model 3=21434
corona pressure and positive Joshi effect 3=19207

Hydrogen—contd

- crystal structure, atomic, isotopes, constant doubling 3=18306
crystal structure, by neutron diffraction 3=1319
diffusion, into Ar, Kr, through porous materials, separation 3=9491
diffusion in quartz. 3=8452
diffusion of He⁴ with HT, thermal 3=21430
discharge, enhanced diffusion, r.f. with mag. fld. 3=1944
discharge plasma, motion of striations 3=19196
effect on elec. resistance of Fe wires 3=10721
effect on mechanical props. of Ni 3=11153
elec. breakdown between plane Pt electrodes, 2nd Townsend coeff 3=7492
elec. breakdown, u.h.f., time-lags 3=7491
elec. discharge, r.f., ion cyclotron waves 3=7622
elec. discharge, toroidal, atom population estimation 3=7579
elec. discharges in, high rate of energy exchange between electrons, evidence 3=24268
electron capture by protons, elec. 3=16908
electron collision cross-sections in d.c. field 3=23942
electron diffusion—mobility coeffs. ratio 3=4023
electron distrib. and d.c. and microwave breakdown 3=12072
electron drift velocity 3=9729
electron prod. by 50-100 keV protons 3=14641
electron scatt., up to 9 eV, calc. 3=17540
equation of state, isotopes, universal, including quantum effects 3=21321
excitation of 2s, 2p levels, by electron collision, 10-50 eV 3=17541
free radicals, in solid films, prod. by p and d bombardment, 100-1000 V, e.p.r. 3=10550
freezing, para, pressure-density-temp. relations, up to 350 atm. 3=14418
Galactic distrib., deviation from galactic plane, from 21 cm obs. 3=23712
gas, electron back diffusion in 3=5693
gas flow, free-molecular, momentum transfer to metal surfaces 3=5456
gas, ionization by H atoms and protons, 10-180 keV 3=5620
gas, ionization, by 100 keV protons 3=19177
in hair-line crack formation in steel 3=3241
interactions of 1.61 BeV/c antiprotons 3=19633
interstellar, H₂, i.r., expected radiation 3=11504
ion beam, use in gyromagnetic ratio meas. 3=24837
ion, H⁺ + H(1s) → H(2s or 2p) + H⁺, theory 3=9732
in ion-molecule reactions, H atoms and ions transfer 3=23540
ionization freq., by electrons, freq. meas. 3=12071
ionization from ground state by electrons 3=7433
ionization, by mag. field, collisional breakup 3=19176
ionization, by protons, 100-450 keV 3=21698
ionization, specific, by positrons and electrons 3=2248
ions, atomic prodn. of r.f. source 3=4008
ions, atoms, molcs, in M-type stars 3=11574
ions, dissociation by strong elec. fields 3=7436
ions, H⁻, e detachment, by e, cross-section, calc. 3=14521
ions, H⁻, in elec. field, mean life against dissociation 3=12083
ions, H⁺ and H₂⁺, collisions with atoms, prod. of Lyman-α radiation 3=6366
ions, H⁺ + He → H + He⁺, 0.025-1 MeV protons 3=14518
ions, H⁺, 100 kV bomb. effects in Si 3=10708
ions, H₂⁺, ²Σ_g⁺ state, potl. curve 3=25096
ions, H₂⁺ beams, charge-exchange and dissociation, in different gases 3=7445
ions, H₂⁺ splitting reactions cross-sections 3=2585
ions, negative, accn. and extraction in Colorado cyclotron 3=5736
ions, negative, elec. dissociation in cyclotrons, synchrocyclotrons 3=5737
ions, single, exosphere, distrib., 1500, 2000°K 3=16240
isotope separation by azeotrope distillation 3=715
isotopic analysis by mass spectrometry 3=13634
liquid, approximate cell model 3=11783

Hydrogen—contd

- liquid, cell model, Lennard-Jones—Devonshire, thermodynamic props., six isotopes 3=21318
- liquid-hydrogen targets made from Mylar 3=7396
- liquid, ionization, recombination and mobility 3=16911
- liquid, para and normal, u.s. velocity rel. to pressure 3=23880
- liquid, π -meson absorption, lifetimes 3=10162
- liquid, quantum effects 3=21319
- liquid, refractive index light, density and temp. var., normal and para. 3=21363
- liquid, in soln. with D_2 , density, m.p. to 20.4°K 3=21343
- liquid, target for electron accelerator 3=14688
- liquid, target, for 1 GeV proton synchrotron at Birmingham 3=14692
- liquid, thermal exchange coeffs., forced convection 3=16605
- mass spectrum in ultra-high vacuum, omegatron study 3=21460
- melting, pressure—temperature equn. 3=12000
- meson capture, μ , calc., V—A theory 3=19665
- molecular beams, clustered, prodn. 3=2678
- molecular, electron collision freq., presence of mag. field 3=21701
- molecular ions, induction energies, spherical term 3=17568
- molecule and ion reactions, with He 3=11342
- molecule, binding energy, relativistic corrections 3=4746
- molecule, dissociation by Ar, statist. study 3=6423
- molecule, dissociative electron capture, calc. 3=4785
- molecule, elec. charge, upper limit 3=10091
- molecule ground state, expansion of exact wave-functions 3=6392
- molecule, h.f.s., of metastable $^3\Pi_u$ state 3=4745
- molecule, interaction energy with He atom 3=17622
- molecule ion, one-centre wave-function 3=8255
- molecule, isotopically substituted, zero-point energy 3=12794
- molecule and mol. ion, wave functions 3=19982
- molecule, neutron scatt., quantum states transition 3=25074
- molecule, one-centre wave functions 3=17577
- molecule, pressure-induced i.r. absorption 3=9512
- molecule, rotational excit. by He and H_2 3=17623
- molecule, valence bond theory 3=6375
- molecules, chemical shift, 20 kg cm⁻², room temp., 60 Mc/s 3=10539
- molecules, perturbation theory 3=15336
- molecules, in stars, detection, by $^{\infty}\Sigma$ continuum 3=16407
- mols., o- and p-, slow neutron scatt., Schrödinger eqn. 3=4734
- mols., spectrum, quadrupole bands 1-0, 2-0, 4000-5000 cm⁻¹ 3=17576
- monatomic gas, high-temp. thermodynamic props. 3=18855
- neutral, sky survey at $\lambda = 21$ cm 3=11505
- nuclear spin—lattice relax. in gas 3=20023
- ortho, collisions, and diffusion, 20.35°K 3=8312
- para., conversion to MgO adsorbed equilibrium, below 20°K, endothermic 3=20994
- para, densities, saturated liquid and vapour, temp. var., vapour press. and heat of vaporization 3=14424
- para-hydrogen, press—density—temp. (15-100°K, up to 350 atm.) relations 3=14146
- para, velo. and absorpt. of acoustic waves, u.s. 25.2°C and relax. times for rot. degrees of freedom 3=14213
- parahydrogen, collisions, rotational energy transfer 3=6435
- permeation in Pd, Ni, purity 3=22819
- permeation rate through Fe 3=22815
- π^- -meson absorption, effect of D_2 contamination 3=17325
- pick-up in Magnox ZR 55, effect on grain growth and mech. props. 3=25761
- planets, radiation, scattered solar Lyman- α , obs. possibility 3=16343
- plasma anomalous resistance 3=12114
- plasma, collision-dominated, spectra 3=7506
- plasma, cool, recomb. and ionization rates 3=21771
- plasma, energy emitted in spectral lines at equilibrium 3=19232
- plasma generating devices to high ioniz. 3=1967
- plasma, H. Balmer line Stark broadening 3=4108

Hydrogen—contd

- spectra, emission, excited by protons and H atoms 3=15338
- plasma jets, H_{α} - γ line shape 3=2000
- plasma, magnetic field (990 kc/s) penetration 3=14585
- plasma, optically thick in red, i.r. 3=16924
- plasma, optically thin, temp. and density meas. 3=7577
- plasma, pinch, θ , neutral gas effects 3=19271
- plasma, pure, prod., by mag. filtration 3=21822
- plasma, radiation temperature resonances, r.f. meas. 3=4121
- plasma, run-away electrons meas. 3=12104
- positron annihil. in liq. and solid 3=17254
- positron scattering 3=17542
- quasi- H_2 mol. in solar atmosphere 3=5257
- ring-discharge, electrodeless, structure study by microwaves 3=7456
- rotational-relax. freq., temp. depend. 3=14212
- solar spectrum, α , β and γ lines, centre-to-limb variations 3=16371
- solid, second-order transitions 3=6450
- in solution with D, solid—liquid phase diagrams 3=21612
- sorption in Th_3Al , equil. pressure isotherms 3=20941
- sorption on Cu, Au films, surface potential, diode meas. 3=13602
- sorption on NiO, MgO, neutron irradiated 3=13604
- sorption on NiO, 20-400°C 3=13603
- spark channels, freely recovering, reignition 3=14544
- spark, formative time lag meas. 3=9736
- specific heat, constant vol., 15-90°K, up to 340 atm. 3=11784
- spectra, plasma, line asymmetry 3=12753
- in steel, hair-line crack formation 3=3241
- stellar, molecular, Rayleigh scatt. 3=3587
- thermodynamic props., -175°C to 150°C, up to 2500 atm 3=23930
- Townsend discharge, low-press; static and quasistatic characteristics 3=7454
- u.v. radiation excited by electron swarm 3=10515
- vapour pressure measurement, 2.5° to 4.2°K, u.h.v. conditions 3=12008
- H—H atom collisions, electronic—vibr. energy transfer 3=6433
- H^- ion beams, from duo-plasmatron, 70 μA at 20 keV 3=9870
- H^- ions, low-energy collision cross-sections in O_2 3=4012
- H^- photodetachment, empirical analysis 3=19180
- H^- photodetachment spectrum 3=4003
- $H^+ + H(1s) \rightarrow H(1s) + H^+$, cross-section 3=9726
- $H^+ + H(1s) \rightarrow H(1s) + H^+$, cross-section calc. 3=1938
- H^+ , H_2^+ and H_3^+ incident on H_2 3=15390
- HD^+ ion, vibrational level pair, excitation, possibilities, for i.r. maser 3=15327
- H_2 breakdown, between plane electrodes, rel. to press. 3=4091
- H_2 , correlation diagram, oscillator strengths 3=17574
- H_2 — D_2 gas mixtures, thermal diffusion 3=21428
- H_2 diffusion and solubility in Cu 3=20220
- H_2 discharge, Townsend parameters, rel. to cathodic surf. layers 3=4033
- H_2 , excitation, from electron swarm energy distrib. 3=6391
- H_2 gas, electron distrib. at high E/P 3=4002
- H_2 gas, electron interchange with H atom beam 3=6342
- H_2 gas, ionized, rarefied, charge-carrier diffusion 3=16906
- H_2 ground state constants 3=8254
- H_2 , ground state, MO calc. 3=19980
- H_2 —HD collisions, cross-section calc. 3=6436
- H_2 and H_2 — N_2 gaseous mixtures, n.m.r. rel. to pressure 3=21451
- H_2 , and H_2 + Xe, powerful impulsive discharges, electron energy meas. 3=7452
- H_2 , i.r. 1-0 band quadrupole spectrum 3=248
- H_2 —inert gas mixture, proton spin—lattice relax. 3=21450
- H_2 interaction with discharge chamber walls 3=7451
- H_2 , in interstellar space, para- and ortho-, relative amounts 3=3535
- H_2 ionization by fast H atoms 3=7427
- H_2 ionization by protons, 0.15-1.1 MeV 3=4006
- H_2 ionization coeffs. in crossed elec. and mag. fields 3=4007
- H_2 — Li^+ interaction, 5 to 25 keV 3=4005

Hydrogen—contd

- H₂, MO's based on central potentials, average Hamiltonian and correlation energy 3=17573
 H₂ molecules, diamagnetic susceptibility, theory 3=8240-1
 H₂-N₂ gas mixture, proton spin-lattice relax. 3=21450
 H₂-O₂ flame, emission, absorpt., and temp. 3=5162
 H₂, one-centre wavefunction calc. 3=17565
 H₂, one-electron potential function 3=17575
 H₂, photochlorination isotope effect 3=11356
 H₂, solid and liquid, nuclear spin-lattice relaxation 3=23253
 H₂, Townsend discharge, photon absorption 3=4029
 H₂ vapour, Townsend coeffs. and Paschen's law breakdown 3=4010
 H₂, vibrational anal. of Heitler-London potential 3=19981
 H₂⁺ beam prodn. 3=7650
 H₂⁺, eigenfunctions, variation approx. 3=7126
 H₂⁺, exact wave-function, on one-centre hydrogenic basis, resolution 3=25094
 H₂⁺, force constants 3=10499
 H₂⁺ ion source, h.f. 3=12252
 H₂⁺, isotopic forms, dissociation by Lorentz force 3=14516
 H₂⁺, one, two and three-centre wave functions 3=22541
 H₂⁺ source for "Ogra" 3=7846
 H₂⁺, formation and stability 3=4004
 H₂⁺, occurrence in field ionization of H 3=4019
 and N₂ mixture, convection and thermal diffusion 3=149047
 48% Ni-Fe, cubic face-centred, diffusion, and mag. props., -130°C 3=15853

Hydrogen compounds

- See also Ice; Steam; Water.
 di-tertiary butyl peroxide, gas phase HCl-catalysed decomp. 3=5164
 hydrides, molecular shapes, rel. to atomic valence state energies 3=721
 hydrogenous substs., π -absorpt. 3=12494
 tritiated, scintillation counting 3=17099
 DCl, vibr.-rot. bands, foreign-gas broadening 3=9511
 DCl, vibr.-rot. bands, pressure broadening 3=9510
 DCl¹⁸, spectral lines, foreign gas effects 3=7244
 DCrO₂, O-O bond by neutron diffraction crystallog. 3=1334
 DON^{14,15}O vapour, u.v. absorpt. spectrum 3=6403
 DO₂, e.s.r. from D₂O₂ soln., 77°K, u.v. irradiated 3=20012
 D₂O, thermal neutron diffusion 3=2270
 DT, soln. in e-D₂, vapour-liquid equilibria, from triple pt. to crit. temp. 3=21626
 H₂BO₃ aq., dielec. loss, chem. relax. effects 3=5447
 HBr, cryst., far i.r. spectrum at 77°K 3=938
 HBr, crystalline, absolute i.r. intensities 3=25460
 HBr, induced Q-branch fundamental i.r. bands 3=248
 HBr, liquid, proton spin relaxation 3=21408
 HBr-rare-gas mixtures, absorption spectra 3=4747
 HBr⁷⁹, spectral lines, foreign gas effects 3=7244
 HCN, pure rotational absorption lines 3=24019
 HC¹³N¹⁵, 3.5 mm rotation resonance 3=14767
 HCl, aq. soln., D substitution, effect on glass transform. temp. 3=23492
 HCl, aqueous, conductivity, electrical, 300-383° 3=18450
 HCl, cryst., far i.r. spectrum at 77°K 3=938
 HCl, crystalline, absolute i.r. intensities 3=25460
 HCl gas, i.r. absorption, up to 1200°K 3=16661
 HCl, induced Q branch fundamental i.r. bands 3=248
 HCl, liq. and gas, proton spin-lattice relax. 3=11808
 HCl, liquid and gas, proton spin-lattice relax. 3=21416
 HCl, liquid, proton spin relaxation 3=21408
 HCl overtone lines, self-broadened, widths 3=4748
 HCl, pressure-induced shifts of i.r. lines 3=17607
 HCl-rare-gas mixtures, absorption spectra 3=4747
 HCl solns., conductivity electrical, 50° 3=23547
 HCl, sound propagation in critical-temp. region 3=18858
 HCl, sound velocity in critical region 3=18859
 HCl spectra, pressure shifts by noble gases 3=11837
 HCl, spectral lines, foreign gas broadening. 3=173
 HCl, vibrational transition probabs. calc. 3=12803
 HCl¹⁸, spectral lines, foreign gas effects 3=7244
 HCl³⁷, i.r. absorption bands, dispersion 3=14345
 HCrO₂, O-H-O bond by neutron diffraction crystallog. 3=1334

Hydrogen compounds — contd

- HF, force consts. and internuc. distances, one-centre calc. 3=22564
 HF, molecular wave-functions 3=8256
 HF, molecule, diamag. suscept. calc. 3=8258
 HF molecule, diamagnetic susceptibility, theory 3=8240-1
 HF, nuclear magnetic relaxation 3=22600
 HF, Stark effect and hyperfine structure 3=19984
 H halides, vibr.-rot. lines, pressure effects 3=6377
 HI addition to isobutene and vinyl chloride 3=11338
 HI, fundamental and overtone line spectra 3=25097
 HI gas-phase reaction with CH₃I 3=11339
 HI, kinetics of gas phase addition to ethylene 3=6915
 HI, reaction with ethyl iodide 3=20978
 HI, spectral line strengths and widths 3=4749
 HI, spectrum 1.2-3 μ 3=24023
 HNC, i.r. identification 3=22584
 HNCN, free radicals, spectrum and structure 3=8307
 HNCO, molcs., Urey-Bradley force field, and thermodynamic props. 3=12799
 HNCS, molcs., Urey-Bradley, force field, and thermodynamic props. 3=12799
 HN₃, photolysis in solid CO₂, i.r. spectra 3=3402
 HNO₂ \leftrightarrow NO + NO₂ + H₂O, vapour-phase equilibrium 3=25813
 HON^{14,15}O vapour, u.v. absorpt. spectrum 3=6403
 HO₂, e.s.r. from H₂O₂ soln., 77°K, u.v. irradiated 3=20012
 HO₂, i.r. spectroscopic evidence 3=17586
 H₂O, pure rotational absorption lines 3=24019
 H₂O₂, solid, $\Delta M = 2$ e.s.r. transitions, rel. to u.v. irradiation 3=23229
 H₂O₂:N₂ system, i.r., matrix isolation 3=15349
 H₂S, as possible molecular beam frequency standard 3=12882
 H₂S, liq., density rel. to temp. 3=14147
 H₂S, liq., slow neutron scatt. 3=14141
 H₂S molecule, Stark effect calc. 3=8231
 H₂S, neutron scatt., total cross-section 3=4733
 H₂S, S X-ray spectrum, K absorpt., Stark effect and excitons 3=23097
 H₂S, solid, crystal struct. & phase transition 3=1325
 H₂S, velo. and absorpt. of acoustic waves, u.s. 25.2°C and relax. times for rot. degrees of freedom 3=14213
 H₂S, i.r. spectrum and internal rotation 3=6401
 H₂SO₄, aq. soln., transport props. meas. 3=9448
 H₂SeO₃, molten, Raman spectra, detection of H₂Se₂O₅ 3=137
 HT, soln. in e-H₂, vapour-liquid equilibria, from triple pt. to crit. temp. 3=21626
 H₂X (X=O, S, Se), molec. force constants, comparison 3=8277
 OH⁻ ions, low-energy collision cross-sections in O₂ 3=4012

Hydromagnetics

See Magnetohydrodynamics.

Hydrometry

See Flowmeters.

Hydrostatics

- floating of long square bar 3=23837
 liquids, electrohydrostatic pressure distrib. 3=9479

Hygiene

See Medical science.

Hygrometers

- dry and wet bulb temps., direct humidity indication 3=9017
 electric elements, evaporated-film appl. 3=1425
 electrolytic, and other moisture meters 3=1574
 hair and thermal and other moisture meters 3=1573
 optical, for turbulent humidity pulsations 3=7253
 water vapour turbulent flux meas. 3=16209

Hyperfragments

See Hypernuclei.

Hypernuclei

- binding energies, mass number > 5 3=10229
 decay, 5 examples prod. by 500 MeV/c K⁻ in emulsion 3=12569
 decay, mesonic, evidence 3=19758
 decay, π^+ , effect of $\Lambda \rightarrow \Sigma + \pi$, and $\Sigma \pi^-$ decay 3=22275
 decay, rare modes search 3=22279
 double, light, rel. to Λ - Λ interaction 3=24846
 heavy, prod. by 800 MeV/c K⁻-emulsion nuclei interacts. 3=24789
 due to K⁻ mesons, 1.5 GeV/c, in emulsion 3=10226

Hypernuclei — contd

- Λ , non-mesonic decay, and $\Lambda + N \rightarrow N + N$ interaction 3=22210
- Λ^0 binding energies 3=7973
- Λ^0 , binding energy, $60 < A < 100$ 1=6147
- Λ^0 -hyperfragment, decay by π^+ mode 3=8121
- $\Lambda^0 \rightarrow p + \pi^-$ decay, Q 3=22207
- mesic decays, 92 events analysis 3=10228
- in photographic emulsions, analysis of stars, prod. by 9 BeV protons 3=24848
- by π^- in emulsion, Ag, Br, 17 GeV/c, ang. distrib. anisotropy 3=19872
- prod. and decay, in emulsions, by K^- , 1.3-1.5 GeV/c 3=10232
- prod. by K^- , at 1.5 GeV/c, in emulsion 3=15089
- prod., K^- interactions with emulsion, 50-33 MeV/c 3=17489
- prodn. by 4.5 GeV/c π^- -emulsion nuclei interact. 3=10227
- production, critical momentum for absence of recoil 3=22359
- production, by 8.8 BeV 3=24849
- from proton-emulsion interactions., decomposition 3=19756
- review (non-technical) 3=631
- search 3=22279
- (Σ^+ p) hyperfragment, evidence for 3=8121
- unstable, from 25 GeV/c proton-emulsion interaction 3=17270
- Ξ -hypernuclei predicted 3=5932
- ΛB^{10} 3=24849
- ΛB^{11} 3=24849
- ΛB^{12} , production and mesonic decay 3=7975
- ΛBe^7 , decay by π^- emission 3=7974
- $\Lambda\Lambda Be^{10}$, Λ - Λ interaction, α model 3=24847
- $\Lambda\Lambda Be^{10}$, prod. by Ξ^- , in emulsion, decay 3=22276
- ΛC^{13} , binding energy 3=22274
- ΛC^{14} decay 3=22279
- $^3H_\Lambda$, spin and binding energy 3=4558
- ΛH^3 , analysis rel. to Λ -nucleon hard core 3=10179
- ΛH^3 , ΛH^4 , mesic decays 3=10228
- ΛH^3 , Λ -N interact. 3=19706
- $\Lambda H^3, ^4$, spin 3=22277
- H^4 prodn. by Ξ^- -emulsion nuclei interacts. 3=22215
- He, decay, non-mesonic 3=12569
- Λ He, π^+ mesonic decay 3=19757
- Λ He, stimulated decay 3=4464
- $He^{4,5}$, lifetime 3=15088
- $He^{4,5}$ prodn. by Ξ^- -emulsion nuclei interacts. 3=22215
- ΛHe^4 , decay modes 3=12570
- ΛHe^4 , lifetime, from emulsion decays 3=10233
- ΛHe^4 , mesic decay 3=10228
- $He^4 \rightarrow \pi^+ H^3 + n$ 3=7976
- ΛHe^4 , rel. to $\Lambda\Sigma$ parity 3=4462
- $He^5 \rightarrow He^4 + p + \pi^-$ 3=6148
- ΛHe^5 , lifetime, from emulsion decays 3=10233
- ΛHe^5 , non-mesonic decay 3=6146
- ΛHe^5 rare decay mode 3=7973
- ΛHe^7 , isomeric state 3=630
- ΛHe^7 3=22279
- ΛHe^7 , binding energy, prod. by K^- mesons, 1.5 GeV/c, in emulsion 3=10226
- ΛHe^7 , existence of isomeric state 3=10229
- ΛHe^7 , isomeric state 3=22278
- ΛLi , muonic decay 3=19757
- $\Lambda Li^8 \rightarrow \pi^- + He^4 + He^4$, selection rules for decay 3=10231
- ΛLi^8 , spin 3=22277
- ΛLi^8 , spin, decay 3=10230
- ΛLi^9 decay 3=22279

Hyperons

- See also Mesons.
- in cosmic ray EAS 3=4547
- eightfold-way assignments, in four unitary-multiplet Regge trajectories 3=15040
- $K\bar{K}$ resonan. width, and $\pi^- + p \rightarrow K + \bar{K} + N$ 3=17337
- Λ^0 , binding energies in hypernuclei 3=7973
- Λ^0 , binding energy, in heavy hypernuclei ($60 < A < 100$) 3=6147
- resonances, SU(3) group, 10-dim. rep. 3=4459
- $Y^*(\pi\Lambda)$ reson., study by π -N scatt. theory 3=17343
- Y_1^* , 1660 MeV, from K^- -p interactions, near 760 MeV/c 3=15030
- $Y_0^* \rightarrow \bar{K} + N$, coupling consts., direct meas. 3=24594

Hyperons — contd

- Y_0^* , rel. to low-energy \bar{K} -N interact. 3=24794
- Y_1^* resonance state 3=19871
- Ξ , spurion model 3=12510
- Ξ^- , α parameter 3=19708
- Ξ^- , spin and charge states, generalized field theory 3=24603
- absorption**
- No entries this year
- capture**
- Σ^- , large energy release 3=8121
- decay**
- K^0 , β -decay, non-consistent with universal Fermi interaction 3=4460
- λ , β -decay branching ratio 3=19703
- Λ , α asymmetry parameter 3=4460
- Λ , β -decay, angl correls. 3=7928
- Λ , from K^- -d interact. 3=7921
- Λ , lepton decay, K_{ll} and $K_{e\ell}$ processes 3=4465
- $\Lambda \rightarrow p + e^- + \nu$, rate 3=6069
- Λ , proton and neutron stimulation 3=4464
- $\Lambda \rightarrow \Sigma + \pi$, and hypernuclei decay, π^+ 3=22275
- $\Lambda \rightarrow \Sigma^0$, Coulomb excitation 3=4466
- Λ , small leptonic branching ratio, unitary symmetry theory 3=22205
- Λ , up-down asymmetries, theory 3=17341
- Λ , weak radiative decay, dispersion relations technique 3=7934
- Λ_{e3} , proton spectrum 3=7930
- $\Lambda_0 \rightarrow n + \pi^0$, p-wave emission 3=12570
- Λ^0 , neutral branching ratio meas. 3=24787
- $\Lambda^0 \rightarrow p + \pi^-$, asymmetry parameter 3=15042
- $\Lambda^0 \rightarrow p + \pi^-$, Q 3=22207
- leptonic, in intermediate boson theory 3=19552
- leptonic, rel. to universal Fermi interact. 3=4333
- leptons, and unitary symmetry 3=15035
- nonleptonic, $|\Delta I| = \frac{1}{2}$ selection rule 3=2197
- nonleptonic modes, branching ratios and asymm. factors 3=24619
- nonleptonic, pole approx. and strong coupling consts. 3=15036
- nonleptonic, simple model 3=12505
- Σ , α asymmetry parameter 3=4460
- Σ , $|\Delta I| = \frac{1}{2}$ selection rule validity 3=22212
- Σ , four-body, composite model 3=24799
- $\Sigma \rightarrow \Lambda + e + \nu$ decay, as test of conserved vector current theory 3=7933
- $\Sigma \rightarrow \Lambda$, and unitary symmetry 3=15035
- $\Sigma \rightarrow \Lambda + \pi$, coupling consts., direct meas. 3=24594
- Σ , π , and hypernuclei decay, π^+ 3=22275
- Σ , small leptonic branching ratio, unitary symmetry theory 3=22205
- Σ , up-down asymmetries, theory 3=17341
- $\Sigma^0 \rightarrow \Lambda + e^+ + e^-$ 3=4462
- $\Sigma^0 \rightarrow \Lambda + \gamma$, parity conservation study 3=22213
- $\Sigma^\pm \rightarrow \Lambda^0$, leptonic decay, test of conserved vector current hypothesis 3=7932
- Σ^- , unusual decay 3=8121
- $\Sigma^+ \rightarrow p + \gamma$, possible example 3=8121
- Σ^+ , pion cloud collective motion, effects 3=19553
- Σ^+ , weak radiative decay, dispersion relations technique 3=7934
- Ξ 3=17348
- Ξ , asymmetry parameters 3=17320
- $\Xi^{*0}(\Xi^- \pi^+ \text{ resonance}) \rightarrow \Xi^- + \pi^+$, $\Xi^- \rightarrow \Lambda + \pi^-$ 3=24804
- $\Xi^- \rightarrow n + \pi^-$, upper limit 3=15043
- $Y^* \rightarrow Y + \pi$, meas. methods, from Y ang. distrib., polarizations 3=22204
- $Y_0^* \rightarrow K + N$, coupling consts., direct meas. 3=24594
- Y_1^* , 1660 MeV, from 1.51 GeV/c K^- beam 3=15039
- decay observations**
- $f^0 \rightarrow \pi^+ + \pi^-$ 1260 MeV resonance 3=17313
- $\Lambda \rightarrow p + \pi^-$, det. of KAN parity 3=6083
- Λ_{e3} , ν -p rather than p-e ang. distrib., for simpler interpretation 3=19701
- Λ^0 lifetime 3=12508
- Λ^0 , muonic 3=17342
- $\Lambda^0 \rightarrow \pi^- + p$, polarization parameters 3=7929
- Λ^0 , prod. by π^- , 6.8, 8 BeV/c, forward-backward asymmetry 3=19702

Hyperons—contd

decay observations—contd

- Λ^0 , spark chamber, using relative ionization 3=17140
- Σ^0 , lifetime meas. method, analysis 3=4469
- $\Sigma^+ \rightarrow p + \gamma$, in flight, example 3=22214
- $\Sigma^+ \rightarrow p + \pi^0$, det. of KAN parity 3=6083
- Ξ^0 , ang. asymmetry, rel. to spin 3=7936
- Ξ^0 , from 85 cascades 3=7935
- $\Xi^0 \rightarrow \Lambda + e^- + \bar{\nu}$ 3=17347
- Ξ^0 , lifetime 3=19708
- Ξ^0 , prod. by π^- , 6.8 8 BeV/c 3=19709
- Ξ^0, Ξ^0 , means lifetimes, from cascade hyperons 3=12511
- $\Xi^0 \rightarrow \bar{\Lambda} + \pi^0$ 3=24805

detection, measurement

- Ξ^+ , review 3=4365

effects

- No entries this year

interactions

See also Hypernuclei.

- hyperon-N bound systems 3=17340
- Λ -K system, resonances 3=2320
- Λ - Λ potential, due to π exchange, fourth order 3=19707
- Λ - Λ , rel. to light double hypernuclei 3=24846
- Λ -N, hard-core and 3-body forces 3=19706
- $\Lambda + N \rightarrow N + N$, and non-mesonic decay of Λ hyper-nuclei 3=22210
- Λ -nucleon hard core 3=10179
- Λ - π resonance, proposed P-state 3=4437
- $\Lambda\pi$, Y_1^* reson., 1385 MeV, spin, from $K^- + p \rightarrow \Lambda + \pi^+ + \pi^-$ at 2.24 GeV/c 3=15037
- $\Lambda\pi$, Y_1^* reson., spin and parity, 1385 MeV, from $K^- + p \rightarrow \Lambda + \pi^+ + \pi^-$, at 1.22 GeV/c 3=15038
- $\Lambda\Sigma\pi$, upper limits, from Lehmann vertex function representation 3=19539
- $\Lambda + X \rightarrow \Sigma^0 + X$ 3=2323
- $\bar{\Lambda}$ -p annihilation, statistical model 3=2324
- $\Lambda^0 + \bar{\Lambda}^0 \rightarrow \pi^+ + \pi^-$, Y_1^* , \bar{Y}_1^* , Y_1^{*-} , Y_1^{*+} pair, prod., from $\bar{p} + p$ 3=22209
- Λ^0 - π resonances 3=22174
- π -mesons, resonances, spins, meas. 3=4436
- with pions, with and without doublet symm. 3=7926
- resonances, rel. to nucleus, global symmetry 3=4420
- review, recent developments, semipopular 3=17193
- Σ -K- π system, resonances 3=6087
- Σ -K system, resonances 3=2320
- $\Sigma\Lambda$ coupling, from $\Sigma^+ + p \rightarrow \Lambda + \pi^+ + p$, $\Sigma^+ + p \rightarrow \Lambda + \eta$, possibility 3=17345
- $\Sigma\Lambda\pi$, upper limits, from Lehmann vertex function representation 3=19539
- Σ - π resonances 3=10174
- Σ - π resonances 3=22174
- $\Sigma^- + C_{12} \rightarrow \Lambda B^{12} + n$ 3=7975
- $\Sigma^- + d \rightarrow \Lambda + 2n$, Λ momentum distrib. 3=24803
- $\Sigma^- + d \rightarrow 2n + \Sigma^0$ or Λ , pion-hyperon coupling consts. 3=10176
- $\Sigma^- + d \rightarrow 2n + \Sigma^0$ or Λ , transition rates 3=10177
- $\Sigma^- + p \rightarrow n + \Sigma^0$ or Λ , pion-hyperon coupling consts. 3=10176
- Σ^+ -particles, polarization in paramag. gas 3=4416
- Y^* resonant states rel. to $\bar{K}N$ interact. 3=7922
- Y_0^* (\bar{K} -N bound state), and \bar{K} -H, \bar{K} -D absorpt. discrepancy 3=19697
- Yukawa-type interact. with mesons 3=609

Ξ -hyperfragments predicted 3=5932

- Ξ , strong, coupling consts. 3=19550
- Ξ , in emulsion, $\Lambda\Lambda B^{10}$ prod. 3=22276
- Ξ , $p \rightarrow \Lambda + \Lambda$, process predicted as forbidden 3=5932
- Ξ , strangeness 2, in nuclear emulsion 3=22215

magnetic moment

- Λ^0 , meas. by spin precession technique 3=6084
- Λ^0 , review 3=4365
- meas., magnet, 150 kG, pulsed 3=21933

mass

- f^0 , 1260 MeV, resonance width 200 MeV 3=17313
- K_S^0 - K_L^0 , mass difference 3=4460
- Λ^0 , from $p + \pi^-$ decay, Q 3=22207
- Σ , from $K + N \rightarrow Y + \pi$, in emulsion, Y and π range 3=24800
- Σ - Λ difference, deriv. rel. to Σ - Λ parity 3=10026

Hyperons — contd

mass — contd

- Ξ 3=17348
- Λ , by π^- interact. in hydrogen 3=19674
- Ξ^- 3=19708
- Ξ^- , from 85 cascades 3=7935
- Ξ^- , prod. by π^- , 6.8, 8 BeV/c 3=19709
- Y_1^* , 1660 MeV, from 1.51 GeV/c K^- beam 3=15039
- Y_2^* , ~1500 MeV in $\pi^- + N \rightarrow Y_2^* + K$, search 3=17349

production

- Adair spin analysis with parity nonconservation 3=2229
- $\gamma + N \rightarrow Y + K$, resonance model 3=24797
- $K + N \rightarrow \Lambda (\Sigma) + \gamma$ 3=607
- Λ -hyperon from π -N colls., model 3=4467
- Λ hyperons, by $n + n \rightarrow \Lambda + n$ 3=6085
- Λ -hyperons, by 2.8 BeV/c π^- -mesons 3=4461
- Λ , from K^- -d interact. 3=7921
- Λ , $\bar{K} + N \rightarrow \Lambda + \pi$, role of M meson 3=4446
- ΛK^0 pairs from π^- -p interactions at 7-8 BeV/c 3=2305
- Λ , momentum distrib. from reaction $\Sigma^- + d \rightarrow \Lambda + 2n$ 3=24803
- Λ , $\pi + N \rightarrow \Lambda + K$, role of M meson 3=4446
- Λ , in π^- -p interact. at 7.8 GeV 3=24798
- Λ , π^- -p interact. at 7.8 GeV, polarization 3=22211
- Λ , $\pi^- + p \rightarrow \Lambda + K^0$, modified K^* exchange model 3=19705
- Λ , by $\pi^- + p$, 6.8 BeV/c 3=22208
- Λ^0 , in $\gamma + p \rightarrow K^+ + \Lambda^0$, at low energies 3=10175
- ΛK^+ , photoproduction near threshold, K^* "particle" exchange approx. 3=15041
- $\Lambda^0 K^0$, from $\pi^+ p$ scatt., cross-section 3=7908
- $\Lambda^0 \rightarrow \Sigma^0$ conversion, rel. to Σ^0 - Λ^0 relative parity 3=6088
- $\Lambda^0 (\Sigma^0)$ by K_1^0 -Pb interact. at 100 MeV 3=6280
- in nuclear interact., very high energy 3=6112
- in photographic emulsions, stars with hypernuclei 3=24848
- p -p collisions, 24.5 GeV/c 3=22206
- $\pi^- + p \rightarrow \Lambda + K$, resonances 3=7912
- $\pi^- + p \rightarrow \Sigma + K$, resonances 3=7912
- π on propane, resonances 3=2322
- $\Sigma\pi$ pairs, in emulsion, by K^- 3=24802
- Σ - π pairs, by K^- capture, momentum peak 3=24801
- Σ - π system, narrow momentum line at 171 MeV/c 3=6089
- Σ^+ , from 500 MeV/c K^- in emulsions 3=603
- Σ^- , by p-emulsion interact, 25 GeV/c 3=19626
- Σ^0 , $\gamma + p \rightarrow K^+ + \Sigma^0$, low energy 3=17334
- Σ^0 -hyperons, by 2.8 BeV/c π^- -mesons 3=4461
- Σ^0 , from K^- -d interact. 3=7921
- Ξ , in $\bar{K}N$ collisions, dispersion analysis 3=610
- Ξ , meson-baryon interact. 3=10168
- Ξ^- , by π^- , 6.8, 8 BeV/c 3=19709
- Ξ^0 , in $\bar{p} + p \rightarrow \Xi^- + \Xi^0 + \pi^+$ 3=24805
- Y^* , in K^- capture by two-nucleon system 3=10170
- Y^* , small width, by K meson capture 3=6089
- Y_1^* , meson-baryon interact. 3=10168
- Y_1^* , \bar{Y}_1^* , Y_1^{*-} , Y_1^{*+} pair, in $\bar{p} + p \rightarrow \Lambda^0 + \bar{\Lambda}^0 + \pi^+ + \pi^-$ 3=22209
- Y^* resonance, effect of $\bar{K}N$ state 3=10174

scattering

- K^-N 3=4460
- Λ -nucleon, rel. to π -N coupling constants 3=4468
- Λ -nucleon, two-pion-exchange contrib. 3=17344
- Λ - π , asymmetry parameters 3=17320
- Λ -proton, elastic, meas. 3=6086
- Λ -protons, elastic, meas. 3=7931
- Σ - π resonance at 1404 MeV 3=12509
- ω - ω , Regge poles with complex singularities 3=22090

spin and parity

- $\frac{1}{2}, \frac{3}{2}$, static approx. rel. to $\bar{K}N$ channel 3=4420
- isobars, determination by forward event analysis 3=6082
- Λ -K, experimental evidence 3=4462
- $\Lambda\Sigma$, experimental evidence 3=4462
- Λ - Σ parity relative, in non-linear spinor theory 3=19704
- Λ, Σ , relative parity, from $\Sigma^+ + p \rightarrow \Lambda + \pi^+ + p$, $\Sigma^+ + p \rightarrow \Lambda + \eta$, possibility 3=17345
- Λ, Σ , relative parity, from $\Sigma^0 \rightarrow \Lambda^0 + e^- + e^+$, Dalitz pair, invariant mass spectrum 3=17346
- Λ^0 , prod. by π^- , 6.8, 8 BeV/c, decay, non-conservation 3=19702
- Σ , parity, from K^- -p interact. 3=24793

Hyperons — contd**spin and parity — contd**

- $\Sigma^- \Lambda$ parity relative, in non-linear spinor theory 3=19704
- Σ, Λ , relative parity, from $\Sigma^+ + p \rightarrow \Lambda + \pi^+ + p$,
 $\Sigma^+ + p \rightarrow \Lambda + \eta$, possibility 3=17345
- $\Sigma^0 - \Lambda^0$ relative parity, from $\Lambda^0 \rightarrow \Sigma^0$ conversion meas. 3=6088
- Ξ^- —nucleon parity 3=19552
- Ξ , value $\frac{3}{2}$ predicted 3=554
- $\Xi^- \pi$ resonance, from $\Xi^{*0} \rightarrow \Xi^- + \pi^+$, $\Xi^- \rightarrow \Lambda + \pi^-$
decay 3=24804
- Ξ_{Λ}^- , from ang. asymmetry of decay 3=7936
- Ξ_{Λ}^- , from 85 cascades 3=7935
- $Y^* \rightarrow Y + \pi$, meas. methods, from Y ang. distrib.,
polarizations 3=22204
- Y_1^* 3=2322
- Y_1^* 3=22174
- Y_1^* , $\Lambda \pi$ reson., 1385 MeV, from $K^- + p \rightarrow \Lambda + \pi^+ + \pi^-$,
at 1.22 GeV/c 3=15038
- Y_1^* , $\Lambda \pi$ reson., 1385 MeV, spin, from $K^- + p \rightarrow \Lambda + \pi^+ + \pi^-$
at 2.24 GeV/c 3=15037
- Y_1^* , 1660 MeV, spin, from $K^- - p$ interactions, near
760 MeV/c 3=15030

Hysteresis

See also Dielectric phenomena; Dielectric properties of substances; Ferroelectric phenomena; Magnetization process.

- Alnico a.c. integrals, residual to saturation
mag., ang. var 3=25526
- angular variation, a.c. integrals 3=25526
- dynamic, by damped oscill. fields 3=5804
- ferrites, rectangular loops, and losses, 2mm ring cores
1000 c/s - 5Mc.s 3=15894
- steel, Type E310, on heat treatment, mag., effect of
field 3=20584
- superconductors, hard, and crystal imperfections,
theory 3=19099
- triglycine sulphate, ferroelectric, high pressures 3=23004
- Cu—Ni—Fe a.c. integrals, residual to saturation
mag., ang. var 3=25526
- Mn—Fe ferrites 3=6724

Ice

See also Glaciers; Snow.

- alkaline, e.s.r. new singlet, rel. to O^- radiolysis
production 3=23233
- atmospheric crystals, prod. in thunderclouds 3=11401
- atmospheric nuclei and moon phase, meteor impact
theory 3=21038
- conductivity, -150 to -80°C, ~50 kV 3=22980
- creep behaviour 3=8770
- crystal formation by vapour condensation
below -65°C 3=5082
- crystal glide bands, non-basal, on plastic deform. 3=17763
- crystal growth and surface structure 3=18260
- crystal growth, epitaxial, on organic crystals 3=18285
- crystal growth, in a supercooled aerosol stream, on
models, struct. 3=18252
- crystal growth, on aeroplanes, in clouds 3=18252
- crystallizing effect of PbI₂ aerosols 3=8987
- cumulonimbus clouds, small, glaciation 3=9038
- defect, new type 3=6512
- diffusion of protons and tritons 3=22816
- e.m. wave back-scatter by oblate spheroids 3=9934
- elastic waves in transversely isotropic half-
space. 3=194
- elec. conductivity, d.c., four-electrode meas.
method 3=3973
- electrification by rubbing ice on ice 3=19158
- electron irradiation, ionization distrib. 3=14532
- frazil, crystal growth rate 3=16039
- freezing of droplets in clouds, review 3=1439
- frost, electrification in air-stream 3=21040
- γ -irradiated, atom production, isotope effect 3=2669
- grain boundary motion in bending 3=6527
- Greenland, T variations 3=24887
- ice VII, melting curve to 200 kbar 3=9855
- migration of brine inclusions under temp. gradients 3=8789
- mother-of-pearl clouds 3=1441

Ice — contd

- motion of loaded wire 3=16836
- neutron diffusion, 0°C 3=6017
- neutron diffusion, 0°—80°C meas. 3=4401
- noctilucent clouds at mesopause 3=1440
- nucleating activity of materials, cloud-chamber study 3=1273
- nucleation, by monodisperse NaI 3=8806
- nucleation by various cyclic cpds., mechanism 3=3267
- nucleation process on mica 3=16037
- nucleation process on PbI₂ 3=16038
- orientational defects 3=12996
- proton transfer activation energy meas. 3=22979
- sea, transmission of visible radiation 3=13650
- solar radiation attenuation in ice layer 3=3439
- spongy, formation from supercooled water 3=3928
- "spongy" spheres in atmosphere, radar meas. 3=9041
- surface structure 3=21307
- surface structure, criticism 3=14139
- thermoelectric effects, steady state theory 3=10899
- thermoluminescence rel. to previous stresses 3=13649
- transformations of ice II, III, and V at atmospheric
pressure 3=11202
- vibration frequency, rel. to H—H intermolec. bonds 3=25152
- whiskers growth from supercooled cloud in elec.
field 3=5089
- Ag trapped in, e.s.r., 77°K 3=25575
- H₂O—HF solid solns., lattice defects 3=10644
- OH-radical in, under γ irradiation 3=25150

Illumination

See also Brightness.

- artificial daylight sources, specifications for 3=11406
- bubble chambers, photography of small bubbles 3=24559
- daylight, artificial, colours fluorescent paints rel. to
those in natural daylight 3=14307
- modulation, sinusoidal, by chopper aperture 3=18969
- W radiation, spectral power distrib. from colour
temp. 3=7322

Image converters and amplifiers

- detection efficiency, photoelectric 3=19326
- electron avalanches, photographic meas. 3=12077
- electron image formation, Castaing microprobe 3=21015
- electron optical convertor, resolving power 3=24370
- electron-optical, use in spectral time scans 3=24036
- framing, using magnetic diffraction 3=7640
- gated, for high light intensities, use 3=14644
- generator for linear and frame sweep, electron-optical
light amplifiers 3=24361
- image intensifier tube, "multipactor" type 3=19325
- image orthicon, astronomical use 3=9144
- magnification reduction due to conical and parallel
fields 3=19327
- PIM-3, resolving power 3=14648
- ultra-high speed tubes, review 3=21579
- u.v.-sensitive tube, design and perform. 3=14643
- spark counter, single gap, for image intensifier 3=9849
- superopticon, for time sweep of rapid events 3=24352

Impact

See also Ballistics.

- batting a ball, velocity vectors 3=21268
- billiard-ball collisions, teaching device 3=11654
- colliding plates, explosive bonding 3=11195
- cylinder, rigid circular, on elastic solid calc. 3=94
- demonstration with plastic croquet balls 3=95
- elastoplastic bar on rigid barrier 3=1644
- impact—vibration system, model tests 3=23823
- jets, shaped-charge, penetration 3=11194
- metals, hypervelocity, shock waves 3=21486
- perfectly elastic, of material systems, subsequent
motion 3=1645
- plastic rotating body with plastic half-space 3=16558
- radioactive projectiles in stainless steel and Al,
fraction staying in crater 3=25646
- Al alloy 24S-T, impact fracture 3=3244
- Al, deformation striations, etching, electron micro-
scope exam. 3=23534
- Ge, dislocation and crack formation 3=20758
- Zr—Nb, neutron irradiation, impact props. 3=1234

Indeterminacy

- L_z and ϕ , modification 3=18734-5
- uncertainty principle, entropy expression 3=14036

Indeterminacy—contd

uncertainty principle, new derivation 3=21229

Indium

atom, analytical wave functions 3=25051
 atom, spectrum, oscillator strengths 3=15279
 conduction electron behaviour from optical and elec. props. 3=22676
 in contact with Sn, melting 3=15525
 density, bulk and X-ray 3=25731
 diffusion in CdS in electric fields 3=13052
 diffusion in Mg, film, superimposed, and film superconductivity 3=22805
 diffusion in p-type CdTe 3=22806
 elec. resistance, 4.2°-1.65°K, rel. to sample size 3=2851
 elec. resistance, 10°-14°K 3=2852
 elec. resistance, rel. to impurity 3=25324
 electrical cond. of polycryst. wires at 4.2°K 3=20273
 films and wires, electrical and thermal conductivities 3=15448
 films, conductivity and supercond. critical temp. rel. to electrostatic charging 3=15545
 films, electrical conductivity, rel. to size 3=15548
 films on glass substrate, optical props. 400-1000 m μ 3=25435
 films, optical density meas. 3=20934
 films, structure in density of states 3=24143
 films superconductivity and normal cond. rel. to adsorbed O 3=16872
 films, superconductivity, rel. to residual gases 3=16878
 films, thin, thermal effects during condensation 3=19074
 foils in water, neutron flux perturb. 3=12461
 Hall effect, high-field, at 4.2°K 3=840
 helicon oscillations det. 3=10728
 Kapitza resistance, 1.3-2°K 3=311
 lattice vibrational spectrum and heat capacity below 1°K 3=8348
 liquid, Hall effect 3=144
 liquid Hall effect 3=16636
 liquid, Hall effect, meas. 3=7218
 liquid, solubility of InAs, InSb and InP 3=21333
 liquid, superheated, electron diff. study 3=9440
 magnetoacoustic effects, h.f., and Fermi surface meas. 3=6472
 neutron coherent-scatt. amplitude 3=25201
 plates, apparent resistivity 3=13039
 preparation, high-purity, by distillation 3=20331
 resistance thermometers, mounting and performance 3=9645
 shear strength, 18° to 100°K, up to 7×10^3 kg cm⁻² 3=13375
 sliding of In on In, metal transfer and wedge-forming mechanism 3=13385
 superconducting cylinder, magnetic field penetration rel. to ohmic dissipation 3=24144
 thermal conductivity 3=17668
 vapour, dimeric : monomeric ionic current ratio of vapour 773°-1373°K rel. to neutron irradiation of films 3=19179
 X-ray emission profiles, L β_2 3=8525

Indium compounds

See also Semiconducting materials, indium antimonide.
 nitrate, Raman spectra of aqueous solns. 3=7211
 perchlorate, Raman spectra of aqueous solns. 3=7211
 semiconducting cpds., solubility in liq. In 3=21333
 sulphate, Raman spectra of aqueous solns. 3=7211
 AlSb, fusion curve at high pressures 3=14417
 GaAs, fusion curve at high pressures 3=14417
 GaSb, fusion curve at high pressures 3=14417
 Hg-In alloy, liquid, Hall effect 3=9476
 In alloys, superconducting transition 3=7403
 In arsenides, X-ray study, lattice periods 3=20836
 In Heusler alloy, Curie temp. change by hydrostatic pres. 3=11026
 In-Al superconducting films, crit. temp. increase on exposure to water vapour 3=19107
 In⁴s, atomic heat, 12-273°K 3=12928
 InAs, charge and heat transport at low temps. 3=6596
 InAs, Debye temp., neutron scatt. data 3=25201
 InAs diamagnetic susceptibility 3=18058
 InAs diode, maser, optical, mag. tunable, i.r. 3=19494
 InAs diodes, maser action at ~ 31 000 Å 3=20452

Indium compounds — contd

InAs, elec. cond. and viscosity at and above m.pt. 3=5448
 InAs, elec. props., high-pressure effects 3=17886
 InAs, electron and hole scattering 3=17884
 InAs, electron effective mass, depend. on density 3=17885
 InAs, electron transfer 3=20044
 InAs, fusion curve at high pressures 3=14417
 InAs, light transmission, at liquid H temp. 3=6339
 InAs, mag. suscept., 60°-1200°K 3=11027
 InAs, magnetothermal effects 3=17970
 InAs, n-type, i.r. cyclotron resonance 3=12955
 InAs, n-type, quantum galvanomagnetic effects, 20°-360°K 3=4925
 InAs, optical refl. for 1.5-25 eV photons 3=8584
 InAs, reflection spectra, rel. to band struct. 3=925
 InAs reflectivity meas. 3=10910
 InAs reflectivity spectra, visible and u.v., fine structure and temperature dep. 3=10909
 InAs, semiconducting effective electron mass, 293-603°K 3=20333
 InAs, thermoelectricity, 100-600°K, and effective electron mass 3=17970
 InAs, var. with field, up to ~ 300 kOe 3=17887
 InAs-CdSnAs₂ alloys, elec. props. 3=2915
 InAs-GaAs system, complete phase diagram 3=16120
 InAs-In₂Te₃ alloys, reflectivity meas. 3=10910
 (InAs)_{1-(1-x)}(In₂Te₃)_x system, phase diagram and elec. props. 3=10828
 In-As-Te alloy system, critical scatt. 3=2870
 In-Bi (3 at. %), superconductive, thermal cond., 2.16°K, var. mag. field 3=12032
 In-Ge alloys, molten surface tension, rel. to content 3=21335
 InN, films, 1-10 μ from chloride, in electrical discharge in N₂ 3=13565
 In₂O₃, elec. cond. and thermoelec. power, 180°-460°C 3=2918
 In₂O₃, vaporization, mass spectrometric investigation 3=12010
 In oxide, thermal expansion 3=20111
 InP, atomic heat, 12-273°K 3=12928
 InP diodes, laser action, 4.2° to 77°K 3=19493
 InP, dissociation pressure 3=25815
 InP, fusion curve at high pressures 3=14417
 InP-GaAs n-n heterojunction, meas. 3=13088
 In-Pb alloys, corrosion layers, formation and structure 3=20913
 In-Pb alloys, liquid, short-range order 3=21308
 In-Pb alloys, supercond., magnetic field penetration 3=9683
 In₂S₃, i.r. emission 3=20515
 In-Sb alloy, cathode sputtering by Kr ions, 1-10 keV 3=2051
 InSb, atomic heat, 12-273°K 3=12928
 InSb, avalanche, h.f. oscills., effect of mag. field, 77°K 3=6595
 InSb, crystal structure, electron density distrib. 3=11260
 InSb, Debye temp., neutron scatt. data 3=25201
 InSb diamagnetic susceptibility 3=18058
 InSb, diffusion of Cd 3=17784
 InSb, diffusion of interstitial Cu, mechanisms 3=17783
 InSb, distrib. of S impurity in single crystals 3=2790
 InSb, elastic strain energy rel. to surface distortions 3=3219
 InSb, electron effective mass, depend. on density 3=17885
 InSb, electron transfer 3=20044
 InSb, Faraday effect for i.r. 3=15658
 InSb films, undoped, sputtered on glass, structure and elec. props. 3=3357
 InSb, Hall effect, analogue divisor 3=13998
 InSb, Hall effect, independent of mag. field, 0.1-22 kOe, Se doped 3=17883
 InSb, high pressure phase, crystal structure 3=13516
 InSb, high-pressure phase structure 3=20834
 InSb, high-pressure tetragonal phase 3=20771
 InSb, L β_2 X-ray emission 3=8525
 InSb, length changes, rel. to irradiation and annealing 3=22861
 InSb, metallic form 3=13517
 InSb, metallic form, superconductivity 3=12031
 InSb, microhardness, crystal faces, anisotropy 3=18217

Indium compounds—contd

- InSb, microperiodic impurity striations, i.r. meas. 3=22762
- InSb, n-type, e.s.r. and cyclotron resonance 3=18133
- InSb, 1.2-4.0° K thermal conductivity 3=4830
- InSb, optical refl. for 1.5-25 eV photons 3=8584
- InSb, photomagnetolectric phenomena, at room temp. 3=17881
- InSb reflectivity meas. 3=10910
- InSb, semiconducting, Hall effect, cond. 3=25367
- InSb, semiconducting, oscills. electron-hole injection plasma 3=15591
- InSb, semiconducting tunnel diodes, recombination radiation 3=23122
- InSb, specific heat, 20° to 660°C 3=22661
- InSb, superconductivity, transformation temperature 3=19110
- InSb, tensile plastic deformation 3=1223
- InSb thermal expansion, anomalous negative low-temp. values 3=10603
- InSb, thermal props., bonding 3=2914
- InSb, var. with field, up to ~300 kOe 3=17887
- InSb, X-ray spectrum short wave limit 3=4919
- InSb, yield drop rel. to surface oxygen 3=13353
- InSb-In₂Te, alloys, reflectivity meas. 3=10910
- InSb-Sb eutectic alloys, prep., thermoelec. props. 3=23401
- InSe, amorphous, short-range order meas. 3=13515
- InSe, component diffusion, rel. to rectification 3=25293
- InSe, rhombohedral, crystal structure 3=13459
- InSe, Hall effect, elec. cond., 300°-600°K 3=13073
- In-Sn alloys, liquid, short-range order 3=21308
- In-Sn alloys, supercond., magnetic field penetration 3=9683
- In-Sn films, supercond., crit. fields 3=14448
- InSn liquid n.m.r. 3=21419
- In-Sn system, superconductivity 3=19111
- In₂Se₃, films, amorphous structure 3=20915
- In₂Te₃, films, amorphous structure 3=20915
- In₂Te₃ prep. and elec. and thermal props. 3=1345
- In₂Te₃ reflectivity meas. 3=10910
- In₂Te₃-InAs prep. and elec. and thermal props. 3=1345
- In-Tl alloys, supercond., magnetic field penetration 3=9683
- In-24% Bi superconductor, magnetization rel to field strength 3=3954

Inductance

- current systems, calc. by elliptic integrals 3=21939
- law, application to moving conductors 3=19416
- r.f. meas. on theta-pinch plasma 3=412
- two parallel sheets connected by cylindrical conductors, calc. 3=17032

Inert gases

- See also the individual gases.
- adsorptn. isotherms on carbon black 3=1377
- atmospheric, radioactive artificial, nature and sources. 3=25901
- atoms, electron scatt., at zero energy 3=12777
- atoms, repulsive interaction potentials 3=12782
- bubbles in metals, migration and coalescence 3=25314
- charge exchange cross-sections 3=12082
- charge-exchange cross-sections, and Lyman α production 3=16910
- crystal structures, abs. stability 3=23441-2
- diffusion in alkali metal halides after n irradi. 3=15508
- diode type getter ion pump 3=14224
- diodes, thermionic, neg. resist. effects after irradi. 3=2025
- diodes, thermionic, neg. resist. effects after irradi. 3=2026
- discharges, d.c., in inert-gas-metal vapour mixtures 3=9734
- discharges, low-pressure, moving striation mechanism 3=7458
- effect on Hg 2537A line broadening 3=706
- effects on naphthalene solid-vapour equilibrium 3=304
- elec. arcs, temp. and thermal equil. 3=1953
- elec. discharges in, high rate of energy exchange between electrons, evidence 3=24268
- electron distrib. functions, transport coeffs. 3=5628
- electrophoresis, press. depend., and ionization mechanisms 3=14513

Inert gases — contd

- energy loss processes of fast Li⁺ and Na⁺ 3=19186
- glow-discharge, moving striations 3=4164
- glow-discharges, moving striations, critical currents 3=4062
- glow discharges, pulse sputtering 3=24243
- halides, binding 3=4750
- heavy, arc, electric, high-pressure, radiative function 3=14555
- hole theory of liquids and dense gases 3=18800
- ionization by α -particles 3=7424
- ionization, by electrons, up to 100 eV 3=19173
- ionization, by protons, 100-450 keV 3=21698
- ions and atoms, metal-surface bombard., energy transfer 3=22511
- ions, bombardment of Au films 3=10707
- ions, 100-30 000 eV, bombard. of Cu, Au, graphite, secondary emission, positive 3=14665
- ions, range in metals, keV, corrections, due to sticking and saturation 3=19373
- i.r. spectra, using stimulated emission 3=9507
- luminescence, rel. to X- or α -irrad., in elec. fld. 3=21448
- luminescence, X-ray excited, increase due to electric field, pulsed 3=16664
- masers, optical, i.r., 2.5-13 μ , new freq. possibilities 3=17075
- negative resistance 3=21449
- neutron absorpt., scatt. cross-sections 3=12467
- photo-ionization 3=3404
- reactions with N₂ and CO at high pressures 3=3387
- refractive index meas., apparatus for wide temp., pres., range 3=7313
- solid, ground-state energy, Hartree calc. 3=320
- solubility in sea and fresh water 3=23877
- virial coefficients, fluid, rel. to three-body forces. 3=167
- Hg-inert-gas discharges, positive column field 3=7475
- Rb spin relaxation, induced 3=4723
- X-ray spectra, L-absorption 3=8189

Inflammability

See Combustion.

Information theory

- See also Entropy; Random processes; Statistical analysis, applications.
- "bit", subjective value 3=7060
- communications systems, quantum effects 3=484
- information capacity of radiation detectors and light 3=11909
- maser, optical, communication, rate 3=19477
- optical storage and retrieval of information 3=11910-11
- pattern recognition computer 3=16489
- pattern recognition computers, in cascade 3=16490

Infrared spectra

See Spectra.

Instruments

- See also Laboratory apparatus and technique; Measurement; Recording; and under specific subjects, e.g. Astronomical instruments. Some specific instruments are listed separately, e.g. Spectrometers; Thermometers. Where no separate headings exist, entries describing instruments may be found included under the headings of the appropriate quantities or subjects.
- calibration systems, precision and accuracy 3=21187
- 1963 Institute of Physics and Phys. Soc. Exhibition 3=9313
- 1963 Institute of Physics and Phys. Soc. Craftmanship Competition 3=9314
- oscilloscope, cathode-ray, earthing method 3=9696
- thermistor systems, temp. gradient in, effect on accuracy 3=19132
- visual measurement, general theory 3=5286
- Integral equations**
- Boltzmann, general properties 3=25227
- nonlinear, soln., appl. to order-disorder transformations 3=18347
- Percus-Yevick, from Taylor series expansion 3=59
- in potential theory, Fredholm equations 3=23733

Integral equations — contd

- in potential theory, solution by digital computers 3=23734
- Vlasov eqn. for hot plasmas 3=7511

Integrals

See also Calculus.

- Airy, for linear potential problem 3=3706
- Bloch functions, selection rules 3=6484
- collision integral for charged particles in mag. field 3=5654
- Coulomb excitation functions, exponential, asymptotic expansions 3=12573
- Feynman, rigorous summation procedure 3=7088
- nuclear reactors; resonance, effective, in statistical region, calc. 3=692
- one-centre, of extraordinary functions 3=6339
- polycentric, in mol. structure theory 3=8221
- products of associated Legendre functions 3=7085
- related to hypergeom. functions F_1 and Φ_1 3=18688
- similarity integrals for heat and mass transfer 3=1847
- two-centre, over solid spherical harmonics 3=19967

Intensity measurement**acoustics**

- hearing threshold for v. short stimuli 3=13952
- liquid surface of interface deform., capacity change 3=16720
- loudness levels, calc. for musical sounds 3=1558
- rectifiers, linear and quadratic, and linear scales 3=18945
- rooms, growth and decay transients 3=3857
- speech, rel. to sound and subglottal pressure 3=13945
- underwater transducer, power meas. 3=9567
- u.s. field, torsion balance meas. 3=18940

Interface tension

See Surface tension.

Interference

- electron beams in crystals, moiré fringes 3=3376
- electrons, experiments and theoret. interpretation 3=439
- photon "beat" generation process 3=7302
- teaching demonstration, two slit sources, using 3 cm e.m. waves 3=18687

acoustic waves

- "beats" and "beat notes", meanings. 3=212
- beats, demonstration expts. 3=23985
- 2 soundbeams, nonlinear interaction 3=18932
- underwater, between direct and surface-refl. rays. 3=213
- u.s., variable path length 3=18939

electromagnetic waves

- microwave polar interferometer 3=19007
- plasma, electron behaviour meas. 3=9795
- plasma, nonlinear, at free space boundary 3=9789

light

See also Optical films.

- Alford and Gold effect, rel. to interference 3=1830
- Brewster and superposition bands, occurrence 3=1828
- contrast of fringes for wave front deforms. 3=24049
- at electrochemical boundary layers 3=11933
- far-field pattern of laser 3=24513
- films, refractive index meas. 3=11917
- filters, i.r., analysis 3=19011
- filters, transmission, for far u.v. 3=1831
- filters, transmitting short- and reflecting long-wavelength regions 3=19012
- Fizeau fringes, multiple-beam, formation factors 3=9607
- Fresnel, white light, transmission method 3=19014
- image formation, teaching of Abbe theory 3=24009
- incoherent, possible detect. from correl. expts. using coincidence counting 3=21511
- large path difference, using spherical Fabry-Perot system 3=16797
- line shift meas., use of refl.-gratings 3=19015
- line shift meas., use of refl. gratings 3=19016
- maser, GaAs, ends 3=24528
- by maser, optical, beams, two independent 3=16795
- meas. of bending of shells 3=7153
- microscope, interference, transmitted—light 3=16752
- Moiré fringe method for surface distortion, errors 3=1829
- multiple-beam, enhancement of magneto-optical effects 3=20449
- multiple-beam transmission-like Fizeau fringes in reflection system 3=16796

Interference — contd**light — contd**

- new system for use in microscopy 3=3887
- partially coherent quasi-monochromatic rel. to polarization effects 3=11931
- polarized light, for contrast transmission function meas. 3=21522
- ruby laser beams 3=23056
- ruby laser, emission coherence studies 3=24529
- ruby laser emission, time-resolved interferometry 3=11907
- transmission-like reflection fringes 3=9609
- Two-beam and multiple-beam phenomena 3=257
- u.s. optical phase gratings 3=9610
- visibility of fringes for small path diffs. 3=3886
- Zernicke effect, vector method 3=11932
- He-Ne laser, fringes with long path difference 3=9608
- UF₄ films on UO₂, kinetic deriv. 3=24042

Interferometers

- Fabry-Perot, for spectral line scanning 3=21541
- Fabry-Perot, ultra-rapid scanning 3=261
- Fourier spectrometry, apodization 3=9612
- microwave, polar, for plasma electron density meas. 3=4148
- radio, tracking, three base-line 3=18648
- for spectroscopy, Fourier transform, compensated field 3=21540

acoustic waves

- two crystal 3=16719

electromagnetic waves

- Boltzmann, spectrometry of plasmas, 0.1-10 mm 3=9957
- Fabry-Perot, as model for laser resonator 3=12360
- microwave, X-band, calc. and meas. 3=12313
- plasma density meas., use of focusing lenses 3=7576
- radioastronomical; for very-long baseline use 3=3616
- shock wave profile determ. 3=21479

light

See also optical films

- alignment 3=16791
- common-path type, very stable 3=14364
- common path, with Fresnel zone plates 3=11935
- for deuterium plasma, electron density meas. 3=7582
- Fabry-Perot etalon, fringe-broadening defects 3=21563
- Fabry-Perot etalon, use for monochromator study 3=16781
- Fabry-Perot, for continuous He-Ne laser 3=7317
- Fabry-Perot, for student lab. 3=260
- Fabry-Perot, i.r., resolving power increase 3=11934
- Fabry-Perot, internal illumination technique 3=262
- Fabry-Perot laser resonator 3=9590
- Fabry-Perot, maser action of atoms inside 3=7352
- Fabry-Perot, mirrors, for 2350-20 000 Å, multi-layer 3=24050
- Fabry-Perot, multilayer dielec. coatings for u.v., visible 3=19003
- Fabry-Perot, near u.v., metallic-dielec. mirrors 3=3889
- Fabry-Perot, oscillating, for spectrophotometry 3=16768
- far i.r., for high electron densities meas. 3=9611
- large aperture, with small beam dividers 3=24048
- lasers, diffraction losses 3=24045
- Lummer-Waetzmann, as differential interferometer 3=263
- maser, optical, mode selector 3=17085
- maser, for plasma density meas. 3=19276
- maser, resonator, He-Ne, isolation of 15 modes 3=9974
- maser tube, diffraction studies 3=9614
- for masers, optical, diffraction losses calc. 3=16794
- Michelson and Jamin, in teaching demonstrations 3=19013
- Michelson, for near i.r. spectrophotometry 3=16769
- Michelson, order of interference changes 3=19009
- Michelson, use of excentric light sources 3=21562
- Michelson, visibility and order of interference 3=19010
- Michelson, with precision angle meas. 3=24046
- multiple-beam, for film thickness meas. 3=11746
- Pepsios scanning spectrometer 3=24020
- polar interferometer, two-wave system 3=19007
- polarizing shearing type, transfer functions meas. 3=2404
- radial shearing 3=9613
- reference surface, glass, fire polished 3=21566

Interferometers — contd**light — contd**

- reflectors, three layer, TiO_2 , SiO_2 film thickness meas. 3=16793
- relativity ether drift detection, laser aerosol scatt. proposal 3=18711
- scanning interferometer, limiting precision 3=16792
- simulated, for Fourier transform spectroscopy 3=16771
- two-grating, as Fourier spectrometer 3=16770
- wavefront-shearing, refractive index gradient meas. 3=11936

Interferometry

- meas. of amplitude of oscillating system by fringes obs. 3=23957
- Newton's rings, silver-modified, film thickness meas. 3=9394
- sedimentation obs. in ultracentrifuge cell 3=8979
- N_2 , compressed, spectrum far i.r., rot., collision induced dipole moments 3=17580

acoustic waves

- interferometer, ultrasonic for elast. const. high-press. dep. meas. 3=223

electromagnetic waves

- microwave, gaseous detonation wave velocity meas. 3=198
- radioastronomy, tracking technique 3=9257

light

- amplitude, Fabry-Perot etalon, for enclosed gas density meas. 3=21564
- atmospheric emission, upper, technique 3=3509
- discharge study, 0.4-4 mm Hg 3=9739
- dispersion meas. in i.r. gas absorption bands 3=14345
- electrolytes, restricted diffusion meas. 3=5434
- fringes, photographic records, rapid meas. 3=14362
- isopachics meas., with diffused light 3=19008
- laser multiple-beam, large plate-separations 3=21561
- line profile meas., by Falsvet-Perot etalon 3=14340
- line standards calibration, comparators 3=13988
- Michelson interferometer, for lumin. spectra of optical maser materials 3=7353
- microscope micrometer screw calibration 3=21524
- phase error correction in interferograms 3=14363
- plasma study, Mach-Zehnder interferometer 3=12183
- sedimentation in short columns, study 3=6933
- sensitivity gain enhanced by Fourier spectrometry 3=1815
- separation of optical wiring plates 3=16798
- simulation of channel spectrum transmission 3=16771
- spectral patterns, superposition method 3=14343
- streak, origin and applications 3=3888
- temperature measurement, P I G reflex pulse discharge 3=24229
- thickness meas. of epitaxial films by i.r. 3=1650
- Tolansky's fringes used to meas. film thickness 3=23826
- transfer function meas. of microscope objective 3=11937
- transparent objects, study 3=257
- two-wave streak interferometry of shock waves 3=18900
- velocity meas. rel. to atomic consts. 3=14305
- wavelength meas., quantum limit 3=14304
- SiO_2 films on Si, refr. index and thickness 3=13149

Intermetallic compounds

- See Alloys; Semiconducting materials; and under the compounds of the individual metals.

Internal conversion

- See Gamma-rays, internal conversion.

Internal friction

- amplitude-dependent relax. damping, theory 3=3215
- austenite, N diffusion and temp. depend. 3=20695
- Bordoni peak activ. energy, theory 3=18165
- Bordoni relaxation theory, rel. to exptl. distribution width 3=23296
- covalent crystals, Peierls force 3=23297
- crystals, plastically strained, anelasticity, rel. to debris dipoles 3=23295
- due to diffusion of dislocation kinks trapped by point defects 3=23290
- dislocation energy radiation by accelerated motion through impurity fields 3=23304
- due to dislocation-solute atom interactions 3=20694
- ferroelectric single crystals, meas. by resonator method 3=20698

Internal friction — contd

- films, meas. 3=15975
- glasses, -100 to +450°C, correction 3=15979
- Invar, isothermal holding, magnetodiffusion effect 3=3216
- Invar, and magneto-diffusion, 0-440°C 3=11090
- Fe-Ni alloy (Invar), rel. to magnetic diffusion 3=15977
- Invar, temp., magnetization and C-content depend. 3=3217
- ionic crystals, Bordoni peak, rel. to relaxation loss of kink movement 3=23294
- magnetic materials, meas. 3=16572
- measuring equipment, using flexural vibrations 3=11748
- measurement, frequ. modulation technique 3=7258
- measurement by vel. obs. of torsional oscillations 3=20697
- metals, f.c.c., Bordoni peaks rel. to deformation and annealing 3=23298
- oxide crystals, rel. to point defect motion 3=25614
- paraffin crystals, α -dispersion 3=6781
- peaks, low-temp., after plastic deformation 3=4867
- Permalloy 66, due to ordering 3=11137
- from point defects jumping, symmetry conditions 3=3213
- polyethylene, α -dispersion and mol. motion 3=6781
- polymers, meas. in mid-audio range, 4°-300°K 3=3211
- polypropylene and polyoxymethylene 3=6780
- quartz, meas. at 100, 500, 48 kc/s 3=13336
- quartz, synthetic, effect of ionizing radiation 3=23302
- rutile, relaxation process 3=25265
- solid solutions, frequency depend., effect of solute particles or cavities 3=2727
- steels, hardened, temp. depend. 3=20696
- transition metal oxides, rel. to conduction mechanism 3=10836
- triglycine sulphate, near Curie point 3=13323
- wave motion and anelasticity meas. 3=18170
- Ag wires, Bordoni peaks, position, at low temps. 3=18166
- Ag-Au solid solutions, Zener relaxation, rel. to concentration 3=23299
- Ag-Zn, theory of vacancy interact. 3=8424
- Al, meas. at low freq., temp. depend. 3=11135
- Al, rel. to strain amplitude 3=11138
- Al, var. with quenching temp. 3=15976
- Au, cold worked, peaks at low temps. 3=11136
- Au, meas. 4°-300°K after deformation 3=25613
- Au, plastically deformed 3=3212
- Cu 3=25612
- Cu, after plastic deformation at 4.2°K 3=8757
- Cu, cold worked, peaks at low temps. 3=11136
- Cu, electron irradi. effect 10°-80°K 3=18169
- Cu, electron-irradiated, rel. to defects 3=1218
- Cu, meas. 4°-300°K after deformation 3=25613
- Cu, rel. to electron irradiation 3=8758
- Cu, rel. to vacancy clustering in dislocations 3=23289
- Dy, temp. depend. 3=5017
- Fe, damping spectrum 3=23287
- Fe-Al alloy, rel. to atomic order and ferromag. props. 3=25605
- Fe-C alloys, α -tempered 3=13539
- Fe-C, precipitation of C study 3=6867
- Fe-C, rel. to diffusion, by neutron irradi. 3=10702
- Fe-Cr alloys, quenched, damping capacity 3=5060
- Fe-N, cold-worked, interstitial-dislocation interaction 3=23293
- Fe, peak, 250°C 3=8756
- Fe, rel. to deformation amplitude 3=6779
- Fe, 250°C, due to dissolved oxygen or not 3=23300
- Fe whiskers 3=8763
- Fe wires, carbonized 3=13333
- Ga, temp. depend. 3=5017
- Ge, dislocation mobility 3=23288
- Ho, rel. to temperature 3=11091
- KCl, additively coloured 3=23291
- Mg and Mg alloys, Bordoni peaks 3=22650
- MgO, dislocation damping at low freq. 3=3214
- Nb, α and ϵ -peaks, deform.-induced 3=23303
- Nb, interstitial-dislocation interaction 3=23309
- Ni, effect of annealing in moist H_2 3=20722
- Ni, rel. to deformation amplitude 3=6779
- Ni, temp. var. 3=3209
- Ni-Au alloy, rel. to temp. 3=1217
- Ni-Co alloys, effect of magnetic annealing 3=8681

Internal friction—contd

- Pb, effects of temp (room-200°C), and number of elastic-plastic cycles 3=6778
- Pb, overstressed microregions 3=11142
- Pt wires, Bordoni peaks, position, at low temps. 3=18166
- Si, rel. to dislocation kink motion 3=10663
- Sn, overstressed microregions 3=11142
- Ta, peaks, low-temp., amplitude-dependence 3=18167
- Ta, rel. to interstitial-dislocation interaction 3=23292
- Ta-H system 3=18168
- Tb, rel. to temperature 3=11091
- ThO₂-CaO, theory, rel. to dielec. and mech. relaxation 3=20700
- TiO₂, lattice friction in plastic deform. 3=23328
- V, from ordering of impurities 3=20697
- V-H alloys, H conc. depend., -190° to +210°C 3=21286
- W, temp. depend. rel. to recovery after work hardening 3=11174
- Zn, polycrystalline, and creep 3=18190
- Zn, polycrystalline, in tension 3=18200

liquids

See Liquids; Viscosity, liquids.

Internal stresses

See Stresses, internal.

Interplanetary magnetic fields

- geomag. field-solar wind interaction, effect 3=25958
- and sun, activity, Pioneer V meas. 3=16329

Interplanetary matter

- absorbing particles, capture by solar radiation field 3=9188
- accretion equation solution, special case 3=18594
- antimatter proportion, cosmic ray data 3=9163
- asteroid Thule, motion 3=1510
- charge particle data from Soviet rockets 3=3539
- charged particles meas., 187-339 km 3=9119
- cosmic dust, Mariner II detection 3=9164
- dust concns. near earth, capture processes 3=3540
- dust distribution near earth 3=3541
- and E-region irregularities 3= 11437
- earth's dust envelope, distrib. 3=23665
- 88-168 km, rocket collected, electron microscope examination 3=18592
- electron density, from zodiacal light spectrum 3=1509
- enhanced density near earth, origin 3=21089
- Fe₂O₃, accumulation on earth, correl. with meteor showers 3=18593
- geocoma hypothesis rel. to Lyman- α problem 3=13779
- gravitational concn. of particles near earth 3=23666
- H, neutral, distrib., from H α emission 3=6992
- information obtained by Mariner II, possibilities 3=11616
- ionized gaseous envelope of earth, structure 3=3484
- Mercury, erosion, by meteoric impacts 3=16352
- particle size, from wavelength-polariz. depend. 3=7019
- photometric obs., phase law theory 3=3542
- plasma flow round earth 3=9287
- plasma meas., by Explorer 10 3=25993
- plasma streams, effect on geomag. field 3=18568
- semiempirical model 3=3538
- solar corpuscular streams, m.h.d. instability 3=9213
- solar wind-magnetosphere interaction 3=9134
- sputtering rates under solar-wind bombardment 3=23667
- study by use of comet tails, validity 3=5247
- sunlight scatt. by, counter glow 3=1469
- zodiacal dust cloud, origins 3=18595

Interstellar matter

- accretion equation solution, special case 3=18594
- antimatter proportion, cosmic ray data 3=9163
- cloud, structure and model 3=16326
- condensation, mass-function in galactic clusters 3=16325
- cosmic ray fragmentation, effect of 3=15067
- density of neutrinos, gravitons, baryons in universe, upper limit 3=1507
- diffuse band, 4430 Å, photoelec. meas. 3=9161
- dust grains, suprathermal particles, effect on size distrib. 3=11508
- expansion of clouds, virial theorem appl. 3=18591
- gas clouds, self-gravitating, fragmentation 3=11498
- gas, heating, by cosmic rays, induction mechanism 3=23664
- graphite particles as interstellar grains 3=3537

Interstellar matter—contd

- graphite particles, possibly coated with ice 3=21088
- gravitational instability 3=11506
- hydrogen, neutral, sky survey at $\lambda = 21$ cm 3=11505
- intergalactic, rel. to halo gas motions 3=16327
- interstellar radiation field, u.v. obs. 3=1527
- magnetic clouds, size distrib., cosmic-ray data 3=22241
- magnetic fields, meas. in interstellar clouds 3=5282
- paramagnetic particles, starlight polariz. 3=1508
- particle size, from wavelength-polariz. depend. 3=7019
- polarization by graphite flakes 3=9162
- polarization, rel. to wavelength 3=13855
- radio wave emission processes 3=11587
- radiation pressure on gaseous cloud due to resonance line 3=16328
- radiation pressure and star formation 3=3536
- self-gravitating cylinder, oscillations 3=21086
- spectral band, 4430 Å, identification 3=9160
- star-gas dynamics, cooperative phenom. 3=13914
- H atoms, radiation and temp. calc. 3=11507
- H II region formation, method of characteristics 3=25975
- H₂ abundance, basic formation processes 3=25973
- H₂, abundance and distrib. in Galaxy 3=25974
- H₂, i.r., expected radiation 3=11504
- H₂, para- and ortho-, relative amounts 3=3535

Iodine

- adsorbed, diffuse reflection spectra 3=13574
- adsorption on graphite, meas. 3=20940
- atmospheric content. 3=25868
- atom, spectral line blackening in hollow cathode 3=19936
- atoms, reactions with ethyl radicals 3=8972
- atoms, recombination mech. 3=6427
- chemical reaction with Ge, etching, mechanism and patterns 3=13601
- crystals, optical props. 3=6653
- diamagnetic anisotropy 3=8640
- elec. resistivity, variation with temp. and press. 3=8524
- luminescence, vapour, 5525.1 Å line, by 5461 Å Hg line, amplification coeff. 3=12769
- metallic state 3=17812
- molecular recomb. by rare gas, kinetics 3=6424
- molecule, dissociation by Ar, statist. study 3=6423
- recombination to I₂ in NO, rel. to concn. 3=2668
- resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
- spectrum excitation in hollow discharge 3=17527
- in terrestrial rocks, rel. to solar system chronology 3=9166
- vapour, breakdown potential at 50 c/s 3=9514
- vapour, elec. discharge, suppression by I¹³¹, 3=14553
- vapour, radiative lifetime of fluorescence 3=11838
- I⁻, gaseous absorption spectra 3=2565
- I¹²⁷ in mercuric iodide, n.q.r. 3=25596
- I¹³¹ film on fallout particles 3=10280

Iodine compounds

- IF₃, molec. structure, force consts., and thermodyn. props., calc. 3=2631
- IF₃, potential consts. and thermodyn. props. 3=2630
- IF₇, orthorhombic, crystal structure 3=8843

Ion beams

- See also Ion optics; Mass spectrometers; Particle accelerators; Range of particles; Sputtering.
- acceleration by perpendicular electric and magnetic fields 3=9873
- bombardment unit with h.f. source 3=9878
- buncher preserving monoenergetic state 3=24378
- bunching of accelerator beam 3=12257
- charged-particle beams, geometrical props. 3=12256
- conversion to atomic H beam 3=25070
- current detector, down to 10⁻¹⁹ A 3=454
- current monitor, using mag. pickup probe 3=446
- cyclotron, elec. accel. field, phasing effect 3=9890
- cyclotron-produced, meas. by mag. belt 3=2061
- double, instabilities during plasma turbulent heating 3=16985
- electron density, in opposite direction to ions, Langmuir probe meas. 3=5718
- electron loss by fast ions in light media 3=21706
- and electrons, neutralized, mag. barrier penetration, calc. 3=19423
- electrostatic channel for bringing into trap 3=21897

Ion beams — contd

- heavy accel. to 120 MeV in Van de Graaff 3=21907
 instabilities in plasma-beam system in mag. field 3=7625
 intensity, posn. meas. with signal electrodes 3=5726
 interaction of electron-ion beam with plasma 3=24284
 interaction with plasma 3=21792
 interactions, with plasma oscillations, instability 3=4171
 isotope separator beams of different charge states 3=14669
 klystron, positive ion, 5Mc/s 3=9876
 magnet optimization, computer programme 3=16986
 in magnetic channel, transfer matrix 3=14670
 mass and energy losses in a medium, macroscopic renormalization 3=5715
 mean energy meas., optical method 3=24384
 measurement, by elastic waves prod. in solids 3=18889
 microanalysis by secondary emission 3=3422
 neutralization by electron injection 3=12128
 particle beam, charged, interact. with plasma 3=5687
 particle distrib. in beam storage systems 3=12255
 plasma-beam system, magnetodynamic instab. 3=21834
 positive-ion beam in neutral gas, multiple charge exchange 3=21716
 production of neg. beams using noble gas ions 3=9872
 profile, with linear focusing and space-charge effects 3=12254
 relativistic, ribbon, formation, shaping electrodes 3=12246
 transport systems, symmetry props. 3=24381
 use in gyromagnetic ratio meas. 3=24837
 use for hole drilling in solids 3=3695
 Ar, metallographic etching, 1 keV 3=20976
 Cs in plasma, rel. to oscillation excitation 3=5686
 Cs⁺-Cs atom charge transfer, 50-4000 eV meas. 3=5629
 Ge⁺, h.f. source 3=24380
 H₂⁺, from duo-plasmatron, 70 μ A at 20 keV 3=9870
 H₂⁺, duoplasmatron source with gas charge exchange 3=7650
 H₂⁺, charge-exchange and dissociation, in different gases 3=7445
 He⁺, duoplasmatron source with gas charge exchange 3=7650
 Kr, multiply-charged, intensity and distrib. 3=14669
 Si⁺, h.f. source 3=24380
 Xe, multiply-charged, intensity and distrib. 3=14669

effects

- α -brass films, etching, electron micr. study 3=18241
 atomic particles and solids, interactions 3=5713
 charge exchange with neutral gas molecules jet 3=24223
 elastic waves, generation, in solids, pulsed, for energy exchange and beam study 3=18889
 electron microscope, secondary emission, contamination removal 3=9864
 etching effects, on polyethylene fibres 3=23497
 exo-electron emission, as detection method 3=12229
 force on bombarded surface, microbalance meas. 3=23829
 inert-gas, bombard. metal surfaces, energy transfer 3=22511
 inert gas ions, 100-30 000 eV, bombard. of Cu, Au, graphite, secondary emission, positive 3=14665
 luminescence excitatn., damage 3=970
 metals, electron emission, due to rare gas ions 3=9843
 metals, neg. ion emission due to Cs positive ions 3=4205
 metals, secondary electron emission due to H, He⁺ 3=7638
 molecules, ionization, in MeV range 3=20024
 monocrystals, cathode disintegration anisotropy and focused collisions 3=7658
 plasma 3=21769
 range in solid from sputtering yield 3=5721
 secondary electron emission distribution function, by positive ions on metal surfaces 3=12239
 secondary electron yield, meas. 3=14679
 Ag films, etching, electron micr. study 3=18241
 Al, bomb. with Ar ions 3=10706
 Al, crystal point defect clusters, obs. by electron microscopy 3=20159
 Al films, etching, electron micr. study 3=18241
 Al monocrystal, atomic ejection sequences by Ar⁺ bombardment, 50 keV 3=2845
 Al, spike formation on surface by Ar ions 3=22880
 Al, surface, Zr bombard. at \sim 10 keV 3=4219
 ArII excitation by He⁺ and H⁺ 3=12770
 Ar-ions on Ag crystals, surface optical props. 3=20435

Ion beams—contd

effects—contd

- Ar⁺, sputtering of Cu (100) surface 3=10703
 Au, dislocation generation at 100 eV 3=17723
 Au films, damage by inert gas ions 3=10707
 gold, spike regions, form. by A⁺ and Xe⁺ 3=6552
 Bi, films, on Bi cleavage faces, crystal plane orientation 3=16136
 C, on Ti, Pb, Bi, α -activities 3=12644
 on C₂H₆, atomic and molec. ions 3=10549
 CdS, surface effects study 3=8924
 Cs and Rb with Mo surface 3=5714
 CsCl, secondary emission, by K ions 3=16978
 Cu, dislocation generation at 100 eV 3=17723
 Cu, surface, Sn, Zr and Mg bombard. at \sim 10 keV 3=4219
 Ge, electron excitation into cond. band 3=858
 Ge, electron excitation into cond. band 3=6588
 H₂, sputtering of Cu 3=4218
 H⁺, H₂⁺ and H₃⁺ incident on H₂ 3=15390
 H₂ collisions with H₂⁺ and H₃⁺, Balmer emissions meas. 3=25043
 KBr, secondary emission, by K ions 3=16978
 KrII excitation by He⁺ and H⁺ 3=12770
 Kr⁸⁵, in Al channelling events 3=15521
 Li⁺, energy loss processes in rare gases 3=19186
 Li⁷⁺ interference in gases 3=21901
 LiF, secondary emission, by K ions 3=16978
 Mo, damage due to H⁺ and He²⁺ 3=2850
 Mo, electron emission due to He⁺ and Ar⁺ 3=4185
 Mo metal, scatt. process of Rb⁺ and Cs⁺ 3=22854
 N⁺, collisions due to N₂⁺ content 3=21719
 N₂, energy loss of He⁺ per ion pair 3=12081
 N¹⁴ and Ne²⁰, Coulomb excitation of nuclei 3=10237
 Na⁺, energy loss processes in rare gases 3=19186
 NaCl, secondary emission, by K ions 3=16978
 NaF, secondary emission, by K ions 3=16978
 NeI excitation by H⁺ and He⁺ 3=12770
 Ni, dislocation generation at 100 eV 3=17723
 Ni, u.v. and visible radiation, by H ion bombardment, 200 keV 3=7657
 Rn²²², 70-210 keV, α -emission 3=14677
 Rn²²² and Xe¹³⁴ labels in crystals, release 3=823
 Sb, films, on Sb cleavage faces, crystal plane orientation 3=16136
 Si, 100 kV, H⁺ and He ion bomb. effects 3=10708
 Si, secondary emission, by K ions 3=16978
 W, photon emission, He, Ne ions, 25-100 eV 3=21900
 W, secondary electron emission due to He⁺ 3=4182
 W, spike formation on surface by Ar ions 3=22880

Ion counters

See Counters.

Ion emission

See also Thermionic emission, ions.

- in diode, space-charge analysis 3=21868
 field emission from single vapour-grown whiskers 3=9829
 field ionization, field evaporation 3=19370
 field, review 3=19371
 high energy ions from low voltage arcs 3=14662
 for mass spectrometry, electron accel. potl. 3=2056
 oxide cathodes of alkaline-earths, heated 3=4204
 positive ions from metal surfaces 3=4203
 K⁺ and Cl⁻, surface ioniz. on W and Ta 3=5632
 Pt whiskers, field emission 3=9829

secondary

- alkali halides, bomb. with K ions 3=5723
 appearance potls, meas. by space-charge compensation 3=14664
 energy spectra, from atomic particle and solid interactions 3=5713
 graphite, positive, on inert gas ion bombard., 100-30 000 eV 3=14665
 metallic surface, mechanism 3=24372
 metals, negative ions, due to Cs positive ions 3=4205
 Au, positive, on inert gas ion bombard., 100-30 000 eV 3=14665
 CsCl, by K ions, 40-7000 eV 3=16978
 Cu, positive, on inert gas ion bombard., 100-30 000 eV 3=14665
 KBr, by K ions, 40-7000 eV 3=16978
 LiF, by K ions, 40-7000 eV 3=16978
 NaCl, by K ions, 40-7000 eV 3=16978

Ion emission — contd**secondary — contd**

- NaF, by K ions, 40-7000 eV 3=16978
 Pt, bombarded with A⁺ ions, 22 keV 3=24373
 Si, by K ions, 40-7000 eV 3=16978

Ion microscopes

- field, applied to lattice defect study 3=22706
 field emission, recent developments 3=19370
 field, image formation 3=448
 field-ion microscope in metallurgy 3=3311
 field ionization of H₂, occurrence of H₂⁺ 3=4019
 field, review 3=19371
 helium field ion, I-V characteristics 3=21899

Ion optics

- See also Alpha-ray spectrometers; Ion microscopes;
 Mass spectrometers; Particle optics.
 accelerator, electrostatic, axially symmetric,
 numerical design 3=12266
 Browne-Buechner spectrograph, matrix method
 calc. 3=19367
 cyclotron, Berkeley 88 in., beam-transport 3=5791
 electromagnetic isotope separator 3=12788
 e.m. isotope separator, contamination props. 3=12787
 electrostatic channel for bringing into trap 3=21897
 focusing, with multi-electrode systems, analogue 3=19366
 focusing props. of long mag. lenses 3=14673-4
 gun trajectory tracer, electrolytic tank and computer,
 including mag. fields and space charge 3=14655
 in inclined field acceleration tubes 3=14690
 injection into magnetic trap, electrostatic 3=7651
 ion buncher, magnetic, variable-path 3=12257
 magnet mirror, achromatic 3=14672
 magnet optimization, computer programme 3=16986
 particle accelerator, Cockcroft-Walton, 200 kV 3=19382
 paths in mag. field, numerical calc. 3=9874
 periodic field lenses, image formation 3=24382
 quadrupole lenses, pole shape 3=14671
 superbarrier reflection 3=4210
 trajectories, in plane elec. fields, analyt. calc. 3=438

Ion sources

- See also Thermionic emission, ions.
 cathode temp., rel. with arc voltage 3=19365
 crossed-field circular, for mirror-machine
 injection 3=7647
 deuterons, pulse source, low gas expenditure 3=4206
 duoplasmatron, as vacuum u.v. source 3=5525
 duoplasmatron, Dynamag, characts. 3=5717
 duoplasmatron, post-ionization demonstration 3=2044
 duoplasmatron source with gas charge exchange 3=7650
 electron bombard. type, for low-energy collision
 studies 3=21893
 electron diffusion eqn., rel. to electrostatic excitation
 and inductive coupling 3=5716
 electron impact, for e.m. isotope separators 3=16990
 electrostatically focused, use for neutrons 3=9868
 h.f., for electrostatic generator 3=24375
 hooded arc, cyclotron, variable yield 3=17008
 hydromagnetic gun, particle analysis by retarding field
 method 3=7591
 inverse magnetron type, for cyclotron 3=2043
 low-energy, for small specimens 3=14666
 mass spectrometer, transmission improvement 3=24374
 negative, for analysis of residual gas 3=21012
 negative, using Hg pool cathode 3=4207
 150 kV accelerator producing 1 mA 3=19386
 plasma sources, hydrogenous, design and
 construction 3=24306
 positive-ion, r.f. excitation, induction discharges 3=19189
 pulsed-arc plasma gun, energy and mass analysis 3=7588
 pulsed, high frequency type 3=7649
 pulsed, multicharge, with mag. beam separation 3=2045
 pulsed, multicharge, spark-type source 3=2046
 pulsed, with small gas consumption 3=21892
 r.f., 8 mA output, operational characteristics 3=9869
 r.f., electron cyclotron resonance in,
 theory 3=474
 r.f., gas flow regulator 3=4208
 r.f. with several holes 3=7648
 secondary reactions 3=16992
 spark, d.c., for mass spectrometer 3=16989

Ion sources — contd

- sputtering source, for solids analysis 3=21894
 using W, oxygenated, surface 3=14668
 vacuum thermoelement, electron space charge 3=9867
 vacuum vibrator, for mass spectroscopy 3=7659
 Ar⁺, 5mA monoenergetic source 3=12253
 D⁻, 2mA beam 3=14667
 H⁻, from duo-plasmatron, 70 μ A at 20 keV 3=9870
 H₂⁺, h.f., with inductive power coupling 3=12252
 H₂⁺ for "Ogra" 3=7646
 H₂⁺, 200 keV, arc discharge 3=24377
 He²⁺, h.f., with inductive power coupling 3=12252
 T⁺ output 3=24376

Ion velocity

- alkali metal mobilities, in own vapour, calc. 3=14526
 cyclohexane, and heat transfer and electrical
 conductivity 3=14148
 electrophoretic, detm. by Bogolyubov distrib.
 functs. 3=3399
 gases, ionized, rarefied, charge-carrier diffusion meas.,
 by diffusion wave method 3=16906
 in liq. Ar, Kr, Xe, neg. ion mobility 3=1678
 mobility, in O₂ and O₂-H₂O mixtures 3=12080
 mobility in jet of supersat. vapour 3=21712
 mobility, meas. 3=12080
 positive ions in gases, mobility meas. by time of
 flight apparatus 3=7437
 Ag¹¹⁰ in Mg, d.c., and scatt. 3=22831
 Ar, positive ion mobility 3=4021
 in HeII, liquid, β -irrad. 3=5562
 in He^{3,4}, liquid 3=1677
 Hg, plasma, electrons, temp. var., transport cross-
 section effects 3=19236
 Kr⁺ mobilities in Kr and He 3=24220
 N₂, drift velocities in glow discharge 3=24221
 Ne(78%) - He(22%), plasma, low-pressure, weakly ionized,
 electron mobility 3=14525
 O₂⁺ mobility in O₂ and He 3=4064
 O₂⁺, O⁺, O₂⁻ and O₂⁻ in pure oxygen 3=7438
 SF₆, Townsend discharge, by time-of-flight mass
 spectrometry 3=16905
 Xe⁺ mobilities in He and Xe 3=24220

electrolytic

- See also Conductivity, electrical, electrolytic;
 Electrophoresis.
 diffusion layer, use of "friction coeffs." 3=21000
 relaxation field rel. to dielec. const. 3=20998
 CsNO₃, fused, transport number of Cs⁺ ion 3=3796
 H₂SO₄, aq. soln., ion mobilities 3=9448
 Tl, in fused TiCl₄, temp. depend. 3=5433

Ionization

- See also Dissociation; Electrons, ionization.
 in acetylene flame, outer cone processes 3=23542
 atmosphere, near ground, fair weather 3=11390
 atom, by electron impact, classical calc. 3=22492
 atoms, by elec. and mag. fields only 3=14516
 atoms, electron loss in proton collisions 3=10476
 atoms, photoionization from outer subshells,
 model 3=708
 charge exchange, resonant, theory 3=16909
 complex formation cross-sects. in molecule-molec.
 ion interacts. 3=6438
 dispersed systems, equilibrium 3=21696
 double-charging cross-sections, low-energy positive
 ions, meas. 3=21705
 efficiency data, optimum use 3=21710
 electron loss by fast ions in light media 3=21706
 electron shells, meas. 3=10286
 fluids, electrohydrodyn. precipitation of impurities 3=4027
 ion-molecule reaction cross-sections in mass
 spectrometer, velocity dependence 3=14514
 losses, for relativistic electrons, radiation
 correction 3=7826
 low-energy electrons, interactions with water vapour and
 polar molecules 3=16902
 meteors, rel. to luminosity 3=5252
 molecular, probability by energy transfer from inert
 gas atom 3=2675
 molecules, rel. to polariz. and radical deform.
 energy 3=8303
 molecules, in MeV range 3=20024

Ionization—contd

- multistage, with recomb., theory 3=7432
- negative beam prod. using noble gas ions 3=9872
- n-paraffins, fragmentation model 3=16903
- photoionization, absorption cross-section 3=9722
- photo-ionization and electron capture processes in solution 3=16180
- Ar, inner atomic shells, by X-rays 3=25058
- Ar⁴⁰, charge distrib. at high velocities in matter 3=7447
- C, photoionization of lower excited states 3=25048
- C¹², charge distrib. at high velocities in matter 3=7447
- CH₃I¹²⁵ and C₂H₆I¹²⁵ decay, formation of fragment ions 3=18459
- D⁻, 20 MeV, electron detachment by mag. field 3=24213
- H atoms by electrons, incident s-wave distortion 3=10466
- H—electron colls., rel. to interference 3=4018
- H—p scattering, rearrangement collisions 3=4722
- H⁻, by e, cross-section, calc 3=14521
- H⁻ photodetachment, empirical analysis 3=19180
- H⁺ + H(1s) → H(2s or 2p) + H⁺, theory 3=9732
- H⁺, occurrence in field ionization of H 3=4019
- He(1s²), electron capture by protons 3=15304
- He²⁺ + H(1s) → He⁺(2s or 2p) + H⁺, theory 3=9732
- Li, photoionization cross-section, 2300–1450 Å 3=4016
- Li⁺ ions, photoionization cross-section calc. 3=5621
- N atom, electron capture by protons 3=15303
- N, photoionization of lower excited states 3=25048
- N¹⁴, charge distrib. at high velocities in matter 3=7447
- N₂—N₂ collisions, 20–1000 eV meas. 3=4015
- Na, from β-decay of Ne²³, electron shake-off 3=15141
- Ne⁺ to Ne²⁺ by electron impact 3=21703
- Neⁿ⁺—Xe and Xeⁿ⁺—Ne collisions 3=2583
- Ne²⁰, charge distrib. at high velocities in matter 3=7447
- O atom, electron capture by protons 3=15303
- O⁴⁺, by electron impact, cross-section 3=5619
- O⁵⁺, by electron impact, cross-section 3=5619
- O¹⁶, charge distrib. at high velocities in matter 3=7447
- O₂—O₂ collisions, 20–1000 eV meas. 3=4015
- P³², on β decay 3=10286
- Pu^{239,241} II and nucleus, mag. moment 3=17392

gases

See also Plasma.

- acetylene, chemi-ionization by O atoms 3=16904
- acetylene, Townsend coeffs. 3=9721
- acoustic wave, effects, e.m.f., a.c., apparatus 3=19181
- air, attachment and ionization coeffs., 100–300 mm Hg 3=4017
- air, behind shock waves, theory 3=12074
- air, effect of 3-body process of electron attachment 3=24215
- air, effect on stagnation-pt. heat transfer 3=18853
- air, electron irradi., free-electron loss 3=14598
- air, high-pres. spatial growth 3=7428
- air, by shock waves 3=7431
- air, by X-rays, electron conductivity 3=3839
- by α-particles, energy per ion 3=14522
- alpha-particles, slow component search 3=9724
- appearance-potential meas. by space-charge compensation 3=21700
- atmosphere, by fast electrons, energy dissipation calc. 3=23594
- benzene flames, thermal, 1100°–1700°K 3=5623
- binary mixtures, by α-particles, meas. 3=21699
- bromoethane and CS₂, and Lyman-α detection 3=14416
- 1,3-butadiene, cross-sections, 9–25 eV 3=1932
- n-butane, cross-sections, 9–25 eV 3=1932
- cis-butene-2, cross-sections, 9–25 eV 3=1932
- charge-exchange between ions and atoms 3=4026
- charge-exchange processes, exptl. and theoret. 3=4025
- charge transfer between atmospheric ions and atomic O 3=14531
- charge transfer in O₂, N₂ and NO 3=14530
- charge transfer by positive ions, 60–450 keV 3=19185
- collective description of fully ionized gas 3=7618
- conference, Munich (1961) 3=1928
- cyclopentane, cross-sections, 9–25 eV 3=1932
- dense, resonant charge transfer 3=7446
- duoplasmatron, post-ionization demonstration 3=2044
- elec. discharge path, effect of oscill. 3=12066
- electrical resistivity of fully ionized gas 3=9811
- electron avalanche growth, cloud chamber study 3=21711

Ionization—contd

gases—contd

- electron avalanches, photographic meas. 3=12077
- electron distrib. function rel. to ionization and recomb. in elec. and mag. fields 3=4022
- electron energies from second deriv. of probe curves 3=12185
- electron and ion currents, saturation, at moderately high pressures 3=5625
- electron temp., in r.f. fields 3=14529
- electron velocity distrib. in crossed fields 3=12079
- by electrons, energy per ion 3=14522
- energy dissipation mechanisms 3=7507
- equilib. concns., effect of electrostatic interact. 3=9728
- ethane, cross-sections, 9–25 eV 3=1932
- ethylene, cross-sections, 9–25 eV 3=1932
- ethylene, Townsend coeffs. 3=9721
- in flames, chemi-ionization 3=19178
- flames, ion profiles 3=7435
- flames, nonequilibrium ionization 3=24209
- gas molecules, jet, neutral, charge exchange with ion beams 3=24223
- gas—solid suspension at high temp. 3=14527
- glow, non-uniform distrib. rel. to breakdown 3=4060
- n-heptane stream, by low-energy electrons 3=15397
- hydrocarbons, by beta-rays, H isotope effect 3=19171–2
- hydrocarbons, Townsend coeffs., effect of molecular bonding 3=9721
- impurity atom in plasma, life history 3=21770
- inert gases, by α-particles 3=7424
- rare gases, charge exchange cross-sections 3=12082
- inert gases, electron energy distrib. functions 3=5628
- inert, by electrons, up to 100 eV 3=19173
- inert, and electrophoresis, press. depend. 3=14513
- inert gases, energy loss processes of Li⁺ and Na⁺ 3=19186
- inert gases, non-resonant charge-exchange cross-sections 3=16910
- inert gases, photo-ionization 3=3404
- inert gases, by protons, 100–450 keV 3=21698
- interferometry, streak, time-resolved 3=3888
- interpenetration of two ionized gas clouds 3=16907
- ion collision data, by ion cyclotron reson. 3=21697
- ion energies, distrib., current intensities 3=19187
- ion wave instabilities in plane discharge 3=1943
- ionization chambers, self-maintained discharge, due to α-particles 3=4038
- ionization potential meas., electron energy scale 3=9719
- ionized gas mixtures, separation effects 3=5626
- ions by electron impact, cross-sect. meas. 3=7425
- irregularly ionized, refractive index 3=9730
- irreversible processes, kinetic eqn. 3=170
- Langmuir's probe theory, extension to lower pressures 3=5625
- in magnetohydrodynamic generator, nonequilibrium 3=4265
- mass spectrometry meas., many components 3=24113
- methane, by electron impact 3=1929
- methane, ionization coeffs., 9.7–52.6 mm Hg 3=24214
- methane, photo-ionization 3=3404
- methane, Townsend coeffs. 3=9721
- negative ions, radiative formation and destruction 3=4003
- nonequilibrium, prodn. of 3=24210
- observation by ruby laser 3=19170
- photochemistry in photoionization region 3=13618
- photoionization, total and specific cross-sections 3=9509
- plasma, admixture interaction effects, thermal excitation 3=24269
- plasma, for medium temps. and density, theory 3=16933
- in plasma torus TA 2000 3=5680
- n-plutane, cross-sections, 9–25 eV 3=1932
- positive-charge cond. in ionized dense gases 3=24217
- probes, glow-discharge type, in shock tubes 3=1762
- propane, cross-sections, 9–25 eV 3=1932
- propylene, cross-sections, 9–25 eV 3=1932
- by protons, energy per ion 3=14522
- rarefied gas dynamics, conference 3=11813
- in shock tubes, application of microwave techniques 3=1934
- shock tubes, precursor photoionization 3=9550
- behind shock wave in air, kinetics 3=19169

Ionization — contd

gases — contd

- slightly ionized gases, electron distrib. and elec. cond. 3=7441
 slow ion production in atom-atom collision of inert gases 3=366
 stellar equilibrium, eqn. of state 3=16401
 sun, corona, two-step collision process 3=9211
 thermal conductivity contribution 3=3831
 thermal, system with distrib. of ionization pots. 3=12075
 wave propagation in partly ionized gas 3=2009
 Ar, after h.f. pulse, recombination 3=4024
 A by atoms and charged Ne and A ions 3=365
 Ar, dissociation and charge exchange, rel. to Aston bands 3=4020
 Ar, equilib. limits 3=24218
 A, by H atoms and protons, 10-180 keV 3=5620
 Ar, multiple, Auger effect 3=12069
 Ar in Ne-Ar mixture, rel. to breakdown 3=19221
 Ar, photoelectron energy spectra 3=7434
 Ar plasma, deionization in magnetic field 3=19249
 Ar plasma jet, degree of ionization 3=24276
 Ar, by protons, 0.15-1.1 MeV 3=4006
 Ar, quenching by SF₆, electronegative seeding 3=19237
 Ar, by shock waves, normal and oblique, equilib. ionization calcs. 3=23973
 Ar, by 10-25 keV X-rays, reson. press. vars. and pot. prod. 3=7449
 Ar, Townsend coeffs., for low E/p values 3=4011
 Ar⁺-Ar collision data by ion cyclotron reson. 3=21697
 Ar⁺, formation and stability 3=4004
 Be, atomic photoionization cross section 3=6350
 CHCl₃, by charge exchange with primary negative ions 3=7444
 CO, dissociative, by ion impact 3=21709
 CO, by electron impact, prod. of O⁻ 3=361
 CO, mass spectrometric meas. 3=12070
 CO, by protons, 0.15-1.1 MeV 3=4006
 CO₂, by electron impact, prod. of O⁻ 3=361
 CS₂ and bromoethane, and Lyman- α detection 3=14416
 CS₂, photoelectron energy spectra 3=7434
 CS₂, by charge exchange with primary negative ions 3=7444
 Cs in shock tube, mechanisms study 3=1930
 Cs, transients 3=24219
 Cs-He transient discharge, nonequil. ioniz. 3=9727
 D, R-type front of e.m. driven shock wave 3=7277
 D₂ electron collision cross-sections in d.c. field 3=23942
 D₂, Townsend coeffs. and Paschen's law breakdown 3=4010
 H, atomic, by electron impact, cross-sections 3=12073
 H atomic ion prodn. in r.f. source 3=4008
 H beams, exponential growth 3=12076
 H, by electrons, from ground state, calc. 3=7433
 H plasma, cool, spectr. meas. 3=21771
 H, plasma generation devices 3=1967
 H, Townsend coeff. 3=7493
 H⁻ ions in O₂, low-energy collision cross-sections 3=4012
 H⁺ + H(1s) \rightarrow H(1s) + H⁺, cross-section 3=9726
 H⁺, H₂⁺ and H₃⁺ incident on H₂ 3=15390
 H⁺ + He \rightarrow H + He⁺, 0.025-1 MeV protons 3=14518
 H₂, coeffs. in crossed elec. and mag. fields 3=4007
 H₂, ejected electron energy and ang. distrib. 3=19177
 H₂, electron capture by protons, calc. 3=16908
 H₂ electron collision cross-sections in d.c. field 3=23942
 H₂, electron collision freq., presence of mag. field 3=21701
 H₂, electron distrib. at high E/P 3=4002
 H₂, by electrons, freq. meas. 3=12071
 H₂, by electrons and positrons, meas. 3=2248
 H₂ by fast H atoms 3=7427
 H₂, by 50-100 keV protons, cross-section 3=14641
 H₂ by H atoms and protons, 10-180 keV 3=5620
 H₂-Li⁺ interaction, 5 to 25 keV 3=4005
 H, by mag. field, collisional breakup 3=19176
 H₂, photoionization cross-section 3=22610
 H₂, by protons, 100-450 keV 3=21698
 H₂, by protons, 0.15-1.1 MeV 3=4006
 H₂, Townsend coeffs. and Paschen's law breakdown 3=4010
 H₂⁺, formation and stability 3=4004
 He, afterglow, probe studies 3=7440

Ionization — contd

gases — contd

- He, decaying plasma, mechanisms 3=14517
 He, ejected electron energy and ang. distrib. 3=19177
 He, growth times and secondary processes 3=9725
 He, photo-ionization 3=25047
 He, by protons, atomic transitions meas. 3=2560
 He, by protons, 0.15-1.1 MeV 3=4006
 He-Cs mixture, nonequil. photo-ionization 3=24210
 He-Kr mixtures, electron momentum-transfer collision frequ. 3=24220
 He-Xe mixtures, electron momentum-transfer collision frequ. 3=24220
 He⁺, by electron impact, calc. 3=14519
 He⁺ collisions on O₂ 3=21707
 He₂⁺ prod., in mass spectrometer, var. with electron energy 3=14523
 Hg, Townsend coeffs. and Paschen's law breakdown 3=4010
 In vapour, dimeric: monomeric ionic current ratio, rel. to neutron irradi. of films 3=19179
 Kr, after h.f. pulse, effect of direct voltage 3=4024
 Kr, by H atoms and protons, 10-180 keV 3=5620
 Kr, photoelectron energy spectra 3=7434
 Kr, thermal, rate and mechanism 3=14515
 Mg halides, monomeric vapour 3=2673
 N, dissociation and charge exchange, rel. to Aston bands 3=4020
 nitrogen, effect on stagnation-pt. heat transfer 3=18853
 N₂, active, r.f. excited, free electron density 3=1935
 N₂, adsorbed in mass spectrometers, charge transfer 3=24212
 N₂, compressed, Townsend coeffs. 3=21708
 N₂, electron irradi., free-electron loss 3=14598
 N₂, by H atoms and protons, 10-180 keV 3=5620
 N₂, ion drift velocities in glow discharge 3=24221
 N₂, metastable mols. study 3=2571
 N₂ by p and He⁺, energy loss per ion pair 3=12081
 N₂, by protons, 0.15-1.1 MeV 3=4006
 N₂⁺-N₂ collision data by ion cyclotron reson. 3=21697
 N²⁺ from N⁺ by electron impact 3=21702
 N₂⁺, formation and stability 3=4004
 Ne, after h.f. pulse, recombination 3=4024
 Ne, in column excited by u.h.f. at one end, velocity of ionization front 3=4037
 Ne glow discharge, positive ion prodn. by Penning mechanism 3=7474
 Ne, by H atoms and protons, 10-180 keV 3=5620
 Ne, by protons, 0.15-1.1 MeV 3=4006
 Ne-Xe⁺ collisions, rel. to charge n 3=7426
 NO, photoelectron energy spectra 3=7434
 NO, photoionization 3=5622
 NO, photo-ionization efficiency curves, 9-14 eV 3=24211
 O, dissociation and charge exchange, rel. to Aston bands 3=4020
 O-N atomic mixtures, chemi-ionization processes 3=25820
 O₂, electron attachment coeff. 3=19174
 O₂, electron attachment coeff. at low energy 3=362
 O₂, by electron impact, prod. of O⁻ 3=361
 O₂, electron irradi., free-electron loss 3=14598
 O₂, mass spectrometric meas. 3=12070
 O₂, microwave discharge, net ionization freq. 3=9723
 O₂ and O₂-N₂ mixtures, free electron attachment in discharge afterglows 3=4009
 O₂, photo-ionization efficiency curves, 9-14 eV 3=24211
 O₂, by protons, 0.15-1.1 MeV 3=4006
 O₂, by X-rays, electron conductivity 3=3839
 OH⁻ ions in O₂, low-energy collision cross-sections 3=4012
 SF₆, by inelastically scatt. electrons 3=12068
 SO₂, by charge exchange with primary negative ions 3=7444
 Xe, after h.f. pulse, effect of direct voltage 3=4024
 Xe, photoelectron energy spectra 3=7434
 Xe, photo-ionization efficiency curves, 9-14 eV 3=24211
 Xe, thermal, rate and mechanism 3=14515
 Xe-Ne⁺ collisions, rel. to charge n 3=7426

liquids

- argon, electron trapping by O₂ and N₂ impurities 3=19175
 n-hexane, under γ -irrad., rel. to elec. cond. 3=11804
 water, electron irradi., ion distrib. 3=14532
 H₂, recombination and mobility 3=16911

Ionization — contd

solids

- centres, by electron impact, theory 3=8502
- cylinder, by monoenerg. electrons, distribution 3=20256
- dielectrics, study by analogue method 3=1939
- electron beam energy losses in 32 cpds. 3=2780
- particles, thermal and photoelec. 3=9731
- radiation effects, review 3=2841
- semiconductor, diodes, hole-electron 3=10859
- semiconductors, intrinsic equilibrium and thermodynamic activity 3=17836
- Ag¹¹⁰ in Mg, mobility, d.c., and scatt. 3=22831
- Be secondary ion spectra, under bombard. with 10-100 keV ions 3=5713
- Ca, multiple, Auger effect 3=12069
- Cs⁺ ions on Mo surf, secondary emission 3=5714
- Cu target, 29 keV electron beam 3=21019
- F⁺-centres, photoionization theory 3=20243
- Ge, photoionization 3=15578
- K, multiple, Auger effect 3=12069
- K-shell ionization by electrons 3=21019
- Li⁺, photo-ionization 3=25047
- Mg, in GaAs, activation energy 3=4922
- Mo secondary ion spectra, under bombard. with 10-100 keV ions 3=5713
- Pt wire, field ionization 3=12067
- Rb⁺ ions on Mo surf, secondary emission 3=5714
- Si, impact ionization 3=20416
- Si photoionization 3=15578
- W wire, field ionization 3=12067

Ionization, atmosphere

- See also Atmosphere, radioactivity; Ionosphere.
- aero-ion aspiration counters, distorting effects 3=3449
- charge transfer between atmospheric ions and atomic O, 3=14531
- ion concs., absolute, 100-200 km mass spectral meas. 3=21049
- ions of extraterrestrial origin, meas. 3=21050
- by 1962 MA-6 Mercury capsule; radio echo meas. 3=11613
- rel. to nuclear explosions in space 3=13727
- upper, UK1 (Ariel) satellite data 3=16235
- N, electron recombination 3=21717

Ionization, surface

- See also Thermionic emission; Work function.
- mass spectrometer, for initial velo. distrib. meas. 3=24225
- K, on W 3=9733
- KCl, on W and Ta, ion velocity distrib. 3=5632
- Pt wire, field ionization 3=12067
- W, ionization of Sr and Ca atomic beams 3=24226
- W surface, effect of BaO beam 3=23541
- W wire, field ionization 3=12067

Ionization chambers

- calorimeter, pulse-amplitude analyser 3=14496
- capacitor type, for pulsed X-rays recording 3=24420
- cloud type, with alcohol vapour diffusing in argon 3=7745
- compensated, cylindrically symmetrical 3=22030
- use for detection of 0.3 eV resonance neutrons 3=2280
- discharge, self-maintained, due to α -particles 3=4038
- electron path length 3=21704
- feeding nuclear reactor period meter, tune response during startup transients, computer calc. 3=12741
- fission chamber, small-diameter 3=24540
- fission, small, U coated W wire in Ar at 15 atm. 3=17098
- fluctuation decrease by 0.8% acetylene addition 3=2152
- gamma-radiators, Ra equivalents 3=12367
- gamma-rays, pulse response 3=12368
- graphite, thick-walled, absolute sensitivity 3=14821
- hexane, n response, fast 3=19505
- "ionization calorimeter", Pu α -specimen use 3=6096
- isotope determination in β -active gas mixture 3=6187
- liquid-hexane filled, for fast neutrons 3=19650
- NBS P2, calibration, extension to 260 MeV 3=14819
- for particle selection, by meas. E(dE/dx) 3=7744
- photodetectors, u.v., description 3=7337
- pulse ion chamber, resolution and linearity 3=674
- RC6, with low-polarizing voltage for compensating volume 3=22031
- semiconductor, low-noise preamplifier 3=1913
- statistical behaviour, new treatment 3=14040

Ionization chambers — contd

- toluene-argon and n-heptane-argon filled, for α -particles 3=4291
- vacuum u.v. photoionization detector 3=21537
- X-ray meas., calorimetric calibr. 3=2151
- zero-current and polarity effects, expt. 3=14820
- H-Ne proton recoil, for fast neutron meas. 3=24750
- He³, for fast neutrons 3=668
- U²³⁵ fission, B¹⁰ shielded, energy response 3=690

Ionization gauges

See Vacuum gauges.

Ionization potential

- alcohol vapours, in ionization cloud chamber 3=7745
- arc, electric, effect of impurities 3=12096
- arc, C, impurity effects 3=19224
- arcs, dependence on easily ionized impurities, conc. 3=19224
- atoms, Glocker's eqn. for calc. 3=8214
- determination by photoelectron energy measurement 3=7434
- dimethyl ether 3=12851
- electron path length in ioniz. chamber, effect of 3=21704
- measurement, electron energy scale 3=9719
- plasma, reduction of ionization energy, in thermodyn. equil. 3=7604
- radicals from butane break-up 3=4786
- screening consts., electron affinities 3=15272
- 300 molecules, photoionization, meas. 3=7430
- Ar 3=1937
- Ar⁺⁺, corrected value 3=8214
- CH₂ radical 3=360
- CH₃OH, higher, using electron impact Foxgun 3=14520
- CH₄, CH, and CH₃, electron impact data analysis 3=18438
- C₂H₅OH, higher, using electron impact Foxgun 3=14520
- Cu 3=2906
- H₂ 3=1937
- H₂O, higher, using electron impact Foxgun 3=14520
- Li⁺, 1s2s ¹S level 3=2569
- N₂ 3=1937
- NO₂, from ethyl nitrate and nitromethane 3=4014
- O 3=22487

Ionosphere

- See also Electromagnetic wave propagation, ionosphere.
- absorption of radiation 3=3488
- absorpt., 27.6Mc/s, high latit., and geomag. storms and giant pulsations 3=13737
- acoustic wave, excitation by electron streams 3=18528
- anisotropic, induced currents 3=9073
- auroral zone irregularities, radiowave scatt. study 3=13716
- charge exchange, as proton source 3=16242
- charged particle incidence during mag. storms and giant pulsations 3=13708
- chorus bursts, rel. to preceding geomag. disturbances 3=1481
- conductivity, rel. to dynamo current system 3=13709
- conference, Kyoto, 1961 3=15054
- conference, London (1962) 3=11422
- constitution and ionizing-radiation effects 3=13739-40
- cosmic radio noise absorption, rel. to chorus 3=23618
- current systems due to non-periodic winds 3=3491
- current systems motion, and magnetic storms 3=13836
- currents, assoc. with geomag. activity, aurora and telluric currents 3=13832
- damping of magnetic motions 3=25959
- diffusion, horizontal outward, near magnetic equator 3=23607
- dipole aerial behaviour 3=16262
- dipole in lower ionosphere, v.l.f. admittance 3=16263
- disturbances, catalogue, July 1961 3=18529
- disturbances due to nuclear explosions 3=3486
- disturbance, rel. to auroral X-ray event 3=23630
- disturbances, rel. to large solar flares 3=6976
- disturbances, WWV reception in the Arctic 3=11433
- Doppler shift of radio signals 3=13722
- drift in various regions, equatorial meas. 3=13719
- drift measurement by Doppler shift technique 3=13729
- drift movements det., radio star scintillations 3=3493
- drift of irregularities, from radio star scintill. 3=11425
- drift theory of aurora and airglow 3=21066
- drifts, Halley Bay obs. during I.G.Y. 3=13720

Ionosphere—contd

- earth-ionosphere wave guide, v.l.f. radiowave propag. 3=16257-8
 effects of high-altitude nuclear explosion 9th July 1962 3=13701
 effects of recurring flares 3=23612
 electric field, as cause of atomic oxygen red lines 3=23633
 electric field intensity at surface of rocket 3=3487
 electric field magnitude, rel. to mag. disturbances 3=3490
 electroacoustic wave excitation by aeriels 3=11423
 e.m. wave scatt., polarization analysis 3=17054
 e.m. wave equation in dipolar coordinates 3=16252
 e.m. wave propagation, math. problems 3=16247-8
 electromagnetic wave propag., oblique path length and deviation 3=16253
 electromagnetic wave reflection light, from Schlomilch's equn. 3=12331
 electromagnetic waves absorption, decametric, from nuclear explosion 3=7721
 electron attachment coeff. to O_2 3=362
 electron clouds, artificially produced, lifetime and movement 3=21052
 electron concn. meas. by ionosph. soundings and rockets 3=25922
 electron conductivity, rel. to velocity depend. of collision freq. 3=14763
 electron content by Doppler integral of satellite original 3=3494
 electron content, from polarized galactic radiation 3=6980
 electron content, from simultaneous Faraday fading rate and differential Doppler shift 3=11434
 electron content measurement by Doppler shift and fading rate 3=13736
 electron content, total, at middle latitudes, nr. solar cycle peak 3=18526
 electron content, total, below sporadic-E stratification 3=13773
 electron contents, from Faraday effect of Sputnik 3 40Mc/s transmission 3=16272
 electron densities by cross-modulation, College, Alaska, 1960 3=6977
 electron densities, r.f. impedance probe meas. 3=6972
 electron density, conductivity and current system 3=11428
 electron density above F2-layer, UK1 (Ariel) satellite data 3=16236
 electron density profile from ionograms 3=9081
 electron density profiles det., quick method 3=3496
 electron density, topside, effect of nuclear explosion, high altitude 3=18524
 electron density up to 200 km, rocket meas. 3=23610
 electron energies det. from v.l.f. emission 3=13700
 electron heating by solar u.v., calc. 3=25920
 electron motion 3=6973
 electrons, penetrating, meas. 3=13798
 electron temp., geomag. latitude depend. 3=25921
 emissions, discrete v.l.f., cyclotron theory 3=5214
 equatorial aeronomy conference, Huancayo, Peru 3=21044
 equatorial, satellite obs. 3=9078
 exosphere, electron density rel. to gyro freq. 3=5211
 exosphere, isotropic hydromag. waves, models 3=1474
 exosphere, O, H, He, distrib., 1500, 2000°K 3=16240
 exosphere, propag. of hydromag. waves 3=483
 frequency cut-off of solar 5-210 Mc/s bursts 3=1538
 He ion belt 3=9072
 h'(f) records, nonuniform lamination analysis 3=13731
 hydromagnetic waves 3=13742
 hydromagnetic waves, attenuation calc. 3=9074
 impedance of short aerial 3=16261
 interactions with geomagnetic field 3=13705-6
 ion concs., absolute, 100-200 km mass spectral meas. 3=21049
 ion density and electron density and temp. obs. 3=13702
 ionization distrib. about mag. equator 3=13710
 ionization distrib., and nuclear explosions 3=16243
 ionization, field aligned, low latitude, topside obs. 3=25926
 ionization production and electron disappearance equilb. 3=5216
 ionized gaseous envelope, space vehicle data 3=3484

Ionosphere — contd

- ionograms, appl. of method of least squares for approx. 3=11432
 ionosphere, field aligned, low latitude, topside obs. 3=25926
 ionosphere, and nuclear explosions 3=16243
 ions of extraterrestrial origin, meas. 3=21050
 irregularities, due to 2-stream plasma instability 3=23608
 irregularities and drifts 3=13743-4
 irregularities, movement in mag. field, theory 3=23605
 irregularities, radio-wave backscatter study 3=13726
 irregularities, radio-wave phase-paths study 3=13723
 irregularities responsible for radio-source scintillation 3=13713
 irregularities responsible for satellite signal scintillations 3=13714-5
 irregularities, using scintill. meas. at 54 Mc/s 3=13725
 irregularities, topside sounding from rockets 3=16346
 irregularities, wide-angle radio-wave scattering 3=13721
 irregularity distrib. and scintillation, satellite, 54 Mc/s 3=23617
 isotropic, exponential model, rel. to e.l.f. radiowave propag. 3=16260
 jet current, equatorial, rel. to mag. disturbs. 3=5212
 local electron density perturbation, top-side meas. 3=11429
 lower region, new layer long r.f. wave and l.f. radiosonde meas. 3=3492
 lower region, radio wave-fields 3=16255
 lower region, theor. model and radiowave study 3=16254
 lower, wind shears study, meteor trails obs. 3=16277
 magnetohydrodynamics, and explosion, nuclear, high-altitude, mag. var., short time delay 3=23616
 magneto-ionic equations, QL and QT approx., validity 3=1459
 magnetosphere interact. with trapped ions 3=23641
 magnetosphere plasma density meas. 3=13741
 magnetosphere, plasma energization theories 3=13699
 magnetospheric density profile, whistler evidence 3=13728
 nuclear explosions, high altitude, f_{min} changes 3=16265
 numerical maps of characteristics, use 3=9071
 observations during solar eclipse 3=1458
 penetration of v.l.f. radiowaves 3=16259
 plasma and cyclotron spikes, top-side ionograms 3=11430
 quiet ionosphere, model 3=18525
 radiation by charged particle moving in cyl. stratified media 3=16241
 radio pulse reflection at Epstein profile 3=16251
 radiowave absorption, conjugate point relationship at high latitudes 3=13711
 radio-wave absorption, inversion of data for calc. of ionosph. props. 3=16249
 radiowave backscatter echoes 3=13718
 radio-wave backscatter, 300 Mc/s obs. 3=13717
 radiowave study, using emission of Cygnus star 3=13712
 reflection, electromag. waves, perturbation calc. 3=21053
 resonance, due to anisotropic conductivity 3=9075
 satellite meas. using Faraday and Doppler recordings 3=3495
 satellite "topside" obs., v.l.f., whistlers and noise 3=21056
 scattering of e.m. waves 3=6975
 scattering, electromag. waves, calc. 3=16942
 S_4 , dynamo theory 3=11424
 solar-flare effects, Doppler studies 3=13704
 spiral patterns of polar aeronomy disturbs. 3=23611
 storms, due to high altitude nuc. explosion 3=13696
 storms, mag. disturbances morphology 3=23609
 stratified plasma model, e.m. wave reflection 3=16256
 structure, from charged-particle density meas. 3=21051
 sudden disturbances, night time, enhancement of long-wave (27kc/s) atmospherics 3=6965
 sudden disturbances, rel. to solar flare explosive phase 3=13703
 sun, cycle I.G.Y. crit. freqs. and virtual heights, Morocco 3=16266
 sun, disturbances, effects, Nov. 1960 3=18527
 temp., ionic composition, electron concn. 3=16244
 temp. and ionic composition, by electron diffusion, calc. 3=6971
 time-lag between ionosph. and geomag. changes 3=3489
 top-side ionograms, spreading 3=11431

Ionosphere — contd

top-side sounder investigations, Alouette satellite 3=13732-4
total electron content 3=25923
turbulence, rel. to geomag. fld. intensification 3=3516
upper electron density profiles, top-side satellite sounder 3=16245
v.h.f. pulse wave scattering 3=21054
v.l.f. emissions analysis rel. to exosphere 3=23619
v.l.f. emissions, origin 3=13730
v.l.f. phase obs. on effects of solar flare 3=16264
v.l.f. resonances of earth-ionosphere cavity 3=6974
variations during geomagnetic storms 3=13707
waves, e.m. and m.h.d., three-fluid theory 3=16250
wind measurement by radio method 3=9076
winds 3=9077

D-region

D region-profile variations, l.f. and v.l.f. propagation 3=19456
D-scatter irregularities, v.h.f. investigation possibilities 3=11435
disturbances rel. to aurorae at Sodankylä 3=1461
disturbance sudden (SID) rel. to solar X-rays 3=6981
dynamo current intensification, abnormal 3=11428
e.m. wave, absorption, anomalous, winter, and temp. 3=25927
echoes from upper and lower D-region 3=16268
electron cooling by N₂ rotational excitation, calc. 3=3499
electron density, additional data from carrier phase changes 3=16269
electron densities and coll. freqs. from rocket meas. 3=6983
electron density and coll. freq. during polar radio blackout 3=6978
electron density at sunrise, two strata 3=5882
electron density, diurnal and seasonal variations 3=9084
electron density gradient 3=6979
electron density meas. at time of 2' solar flare 3=1462
electron density profiles from cross-modulation 3=6982
electron production by cosmic rays 3=9083
explosions, nuclear, high-altitude, ionization effects 3=21058
ionization, high-latitude, rel. to explosion, July 9 1962 3=16267
ionization impulses, decay 3=18534
ionization by solar X-rays 3=3498
model, e.m. wave reflect. 3=5865
negative ion-electron densities ratio height distrib. 3=16278
polar cap var 10 Nov. 1961, rel. to v.l.f. absorption 3=509
polar, residual ionization 3=9082
solar cosmic-ray bomb. effects, rel. to free-electron density 3=13745
subauroral zone, time, height and latitude distrib. rel. to geomag. activity and aurora 3=1460
temperatures, by 2.89 Mc/s observations 3=5881

E-region

dense ionized layers, due to neutral wind shears, formation and movement 3=13753
drift, recent German obs. and analysis 3=13750
drifts, Lower Hutt (New Zealand) obs. 3=13749
drifts, noon-bearings, variations 3=5221
dynamo current intensification, abnormal 3=11428
e.m. refl. height, rate of descent at sunrise 3=3500
electron density contour tilts meas. 3=5215
electron density, effect of earth's orbit eccentricity 3=13752
electron density maximum, height distortion 3=13747
ionization irregularities, rel. to earth's mag. fld. 3=18536
ionization, recombination coeff. and solar radiation 3=16271
ionization, variations, K, world-wide component 3=18537
irregularities, variation of drift and anisotropy 3=13751
irregularities, vertical distrib., from scintillation of satellite radio signals 3=11437
model, e.m. wave reflect. 3=5865
model, rel. to rocket data 3=13746
sporadic-E. at mag. conjugate pts. at high latitudes 3=13748

Ionosphere—contd

E-region—contd

sporadic-E, equatorial, theory 3=11436
sporadic-E, horizontally moving layer tilt, gravity wave explanation 3=23621
sporadic-E ionization, auroral, meas. 3=1463
sporadic-E ionization by backscatter technique 3=23620
sporadic-E irregularities, v.h.f. investigation possibilities 3=11435
sporadic E layer centred at 113.5 km 3=5222
sporadic E, relation to auroral disturbances and geomag. storms 3=18535
sporadic, moon phase effects 3=21060
sporadic, and thunderstorms and mag. disturbances 3=21059
variations, non-seasonal, Lwiro meas. 3=6984

F-region

activity, April-June 1961, rel. to that of sun 3=13886
changes during magnetic storms 3=18539
collision freq. meas., from ionosonde and riometer obs. 3=23625
cosmic radio noise absorption, F2 component 3=25988
crit. freqs., and outer Van Allen belt intensities 3=16275
decay after instantaneous prod. in F2 3=9091
diffusion of ions at mag. conjugate points 3=13765
disturbance, Feb. 11, 1958, thermal effect 3=21061
disturbances, rel. to nuclear explosions, 1961 3=9069
disturbances, travelling, night-time, at Rarotonga 3=1464
diurnal drift effect of neutral air 3=13764
and eclipse, solar, at mag. conjugate point 3=23624
electron content from cosmic radio-noise absorption 3=6985
electron density above F2-layer, UK1 (Ariel) satellite data 3=16236
electron density by analogue computer 3=5219
electron density contour tilts meas. 3=5215
electron density distrib. rel. to diffusion, nr. magnetic equator 3=18541
electron density, max., from top-side ionograms, and mag. storms 3=11421
electron density profiles, Burkard's model 3=13768
electron distrib. near magnetic equator 3=9094
electron heating, artificial 3=11442
electron scatt. cross-section in incoherent backscatter 3=13772
explosions, nuclear, and foF₂ disturbances 3=13738
foF₂ changes, during great mag. storm 3=3519
foF₂ critical freqn. meas. in solar eclipse 3=25929
foF₂ increase due to nuclear explosion 3=5195
f F₂ irregularity from nuclear explosions, 1961 3=9070
foF₂, mag. declination effects 3=23622
foF₂, over mag. equator, lunar tide correl. 3=1465
F1, model, rel. to rocket data 3=13746
F 1½-layer, observational data 3=11444
F₂, charge density, direct meas., satellite counting-circuits 3=13767
F2, critical frequencies, lunar tidal variation, low latitudes 3=3501
F2, disturbances due to nuclear explosions in atmosphere 3=13762
F2, effects of nuclear explosions, Oct. 1961 3=6987
F2, electron collision freqn. meas. 3=13773
F2, electron diffusion, geomag. control 3=9093
F2, equatorial anomaly at sunspot max. 3=25928
F₁, geomagnetic anomaly 3=13758
F2, horizontal drifts at Waltair 3=16274
F2, instantaneously prod. ionization, decay 3=9091
F2, magnetic field aligned displacement 3=3502
F₂, rel. to magnetic declination 3=23623
F2, model, including vertical drift velocity 3=6986
F2, movements, obs. by direct characteristic recording 3=13724
F-scatter irregularities, v.h.f. investigation possibilities 3=11435
F-scatter, theory, rel. to spread-F 3=11439
F2, solar-eclipse and solar-flare effects 3=13757
F2 tilt, and m.u.f. increase 3=7722
F2, variations during severe magnetic storms 3=13760
F2, variations, rel. to geomag. variations and storms 3=13759

Ionosphere—contd

F-region—contd

- h'(f) records, analysis, using phase refractive index 3=11440
- ion density distributions, daytime, measurement and interpretation 3=11441
- ion temperatures from electron distribution 3=13756
- ionization, above F2 layer, strata, mag. field aligned 3=18546
- ionization diurnal variation peculiarities 3=18545
- ionization drifts, world-wide pattern, rel. to geomag. variations 3=13763
- irregularities, large, drift speeds 3=18544
- irregularities, variations of drift and anisotropy 3=13751
- ledge above F₂, 700-1000 km, 54°N-54°S, evidence 3=9092
- magnetic field, from h'-f records 3=1466
- moon tide in f_oF₂ at low latitudes 3=16276
- movement of perturbations, obs. 3=9090
- night-time, electron continuity eqn., numerical solns. 3=9088
- night-time recombination coefficient 3=13770
- I_{F2}, correl. with sunspot number 3=3503
- photoionization, and Burkard's model for electron density profiles 3=13768-9
- as plasma, nonequilibrium, density fluctuations 3=13771
- reflection coeff., night-time 3=18538
- spread-F at high geomag. latitude, characteristics 3=21062
- spread-F at high latitudes, occurrence probability 3=9088
- spread-F, coincidence with h'F maximum 3=18543
- spread-F, correl. on one night and successive nights 3=5217
- spread F development, and high altitude nuclear explosion 3=9085
- spread-F echoes, fading characteristics 3=18540
- spread-F equator, variations, theory 3=11438
- spread-F, equatorial, mag. activity and F-region height effects 3=13766
- spread-F irregularity prod., theories 3=3507
- spread-F, lunar variations 3=2133
- spread-F motion at equator 3=13775
- spread-F, nocturnal and seasonal var. 3=9087
- spread-F, occurrence at mag. conjugate points 3=5218
- spread-F over polar cap on quiet day 3=9089
- spread-F, rel. to parameters of F-region 3=3504-6
- spread-F, top-side investig., Arouette satellite 3=13734
- stratification 3=21063
- study from nocturnal red band data 3=13774
- temp. vars., 200-700 km, from incoherent backscatter 3=11443
- temperature variation during sunspot cycle 3=13755
- upper, electron density distrib. 3=18542
- upper, electron diurnal and seasonal variations 3=16273
- variations and structure data, from 1959 analysis 3=13754
- variations due to geomagnetic storms 3=13761

Ionosphere measuring apparatus

- Astrobbee 200 rocket instruments 3=5213
- automatic recording of drift meas. 3=18530
- Langmuir probe, characteristics, positive-ion density meas. 3=12180
- plasma probes in space vehicles 3=7571
- simultaneous recording of echo amplitude and h'-f curve 3=13773

Ions

See also Plasma; Thermionic emission, ions.

- acetylene, fragment production cross-sections 3=1932
- actinide group, spectroscopy, for laser appl. 3=7330
- aero-ion aspiration counters, distorting effects 3=3449
- air, effect of bombardment on mica and graphite 3=17806
- antiscreening of nuclear quad. moments 3=19923
- bis(p-nitrophenyl) anions, electron transfer, e.s.r. h.f.s. 3=22597
- catalysis of H-atom recombination 3=16164
- charge-exchange processes, exptl. and theoret. 3=4025
- charge transfer, symm. reson., effect of relative motion 3=1938
- chemical reactions, for positive, with molecules, in radiolysis 3=6927
- collisions with atoms, prod. of Lyman- α radiation 3=6366
- in crystals, electronic polarizability 3=12909

Ions—contd

- cyanogen, normal and excited, reactions, obs. 3=21714
- cyclopropane, fragment production cross-sections 3=1932
- decomposition reactions and stability, theory 3=19375
- detection, sensitivity of Ilford Q₂ plates 3=5725
- dielectric friction on a moving ion 3=12294
- dielectric interactions, bibliography 3=13102
- dimethyl benzene radicals, spin and charge densities, temp. depend. 3=25151
- in electrolyte solutions, interactions with solvent molecules 3=21375
- energy analyser for plasma meas. 3=7588
- energy levels in isoelectronic sequence, empirical relations 3=17522
- ethane, fragment production cross-sections 3=1932
- ethanol, dissociation 3=12870
- ethyl ammonium, long-range N¹⁴ coupling 3=12864
- ethylene, fragment production cross-sections 3=1932
- excitation, by electrons, with Coulombic wave functions 3=19950
- fast multicharged, electron loss investigation 3=712
- growth in supersat. water vapour 3=21712
- halide, gaseous, absorption spectra 3=2565
- Hartree-Fock equations, ground-state soln., iterative method 3=22468
- heavy ions, radioactive, detection system 3=12609
- in gases, multicharged, electron loss 3=7448
- impurities in semiconductors, transport in mag. field 3=6570
- ion drag pumping of dielec. liquids 3=11778-9
- ion-molecule reactions, H transfer, cross-sections, energy depend. 3=23540
- ionization cross-sect. meas. by crossed ion and electron beams 3=7425
- metals, liquid, monatomic, long-range osc. interactions 3=9439
- metastable transitions, using 180° mass spectrometer 3=2665
- molec. ion-molecule exothermic reacts., kinetics 3=6438
- momentum transfer, ion-neutral particle, weakly ionized gas 3=21718
- monomethyl benzene radicals, spin and charge densities, temp. depend. 3=25151
- multicharged, in single-ionized plasma, in const. elec. multicharged ions, ranges and specific energy losses in solids and gases 3=5722
- negative, double-photon photo-detachment 3=21713
- organic, multiply charged, in mass spectra 3=1933
- paraffins from C₁ to C₈, field ionized, mass spectra 3=14524
- propane, fragment production cross-sections 3=1932
- rare earths, anti-shielding factors, calc. 3=742
- in solutions, diffusion of 3 ion species 3=21327
- in spark discharges, concn., time variation 3=2553
- spectra, X-ray satellites, screening 3=10443
- 3d group central, optical electromag. 3=8222
- Thomas-Fermi positive ions, interpolation formulae, graphical 3=7429
- transition metal ions, zero field splittings 3=25164
- Ar, effect of bombardment on mica and graphite 3=17806
- Ar, energy loss and effective charge in H₂, N₂ and Ar, at < 10 MeV/a.m.u. 3=1937
- Ar⁴⁺, ionization potential, corrected value 3=8214
- Ar⁴⁺, range in W at keV energies 3=22878
- Ar⁺-Ar collisions at keV energy, inelastic energy loss 3=709
- Be⁹, range in Al and Au, at 2-21 MeV 3=2048
- C, energy loss and effective charge in H₂, N₂, CH₄, Ar and He, at < 10 MeV/a.m.u. 3=1937
- CCl⁺ and CF⁺ spectra, really due to BF and BCl 3=8252
- Co(ethylenediamine)₃³⁺, optical rotatory dispersion 3=730
- Co II, crystal-field spectra in various cpds. 3=25453
- Cr, adsorbed, by exchange of ions, e.p.r. spectrum 3=8707
- Cr³⁺, in octahedral crystal fields, spectrum 3=25454
- Cr³⁺, in ZnWO₄, e.s.r. and spin-lattice relax. 3=25569
- Cs⁺-Cs atom charge transfer, 50-4000 eV meas. 3=5629
- Cs¹³⁷, range in Al 3=12608
- in Cs plasma, volume recombination 3=24278

Ions — contd

- Cu^{2+} , mag. anisotropy, susceptibility 3=13224
 Cu^{2+} , octahedral complexes, spin inversion and e.s.r. spectrum 3=25570
 $[\text{Cu}(\text{CN})_4]^{2-}$, energy levels, absorpt. spectrum., polarization 3=19992
 D^- , 20 MeV, electron detachment by mag. field 3=24213
 D_2^+ dissociation 3=15391
 D_3^+ dissociation into D_2^+ and D^+ 3=1931
 Fe^{2+} , Sternheimer factors, variational calc. 3=2567
 Fe^{3+} , in andalusite, isomorphism, by e.s.r. 3=20855
 Fe^{3+} , e.s.r., in corundum, temp. depend. 3=5039
 Fe^{3+} , in ZnWO_4 , e.s.r. and spin-lattice relax. 3=25569
 Gd^{3+} absorption bands, oscillator strengths 3=19935
 H^- , bound-free absorption coeff. 3=2557
 H^- , in elec. field, mean life against dissociation 3=12083
 H^+ , collisions with He , H_2 , prod of Lyman- α radiation 3=6366
 $\text{H}^+ + \text{H}(\text{1s}) \rightarrow \text{H}(\text{1s}) + \text{H}^+$, cross-section calc. 3=1938
 $\text{H}^+ \text{H}_2^+$, prodn. by fast H atoms 3=7427
 H_2^+ , Σ_u^+ state, potl. curve 3=25096
 H_2^+ , collisions with He , H_2 , prod of Lyman- α radiation 3=6366
 H_2^+ , isotopic, reaction with isotopic H_2 3=2677
 $\text{H}_2^+ \rightarrow \text{H}^+ + \text{H}^0$ or $2\text{H}^+ + \text{e}^-$, cross-sections in argon 3=2585
 H_2 , induction energies, spherical term 3=17568
 H_2^+ , one, two and three-centre wave functions 3=22541
in H_2O vapour glow discharges 3=7480
 H_3^+ , occurrence in field ionization of H 3=4019
 He , energy loss and effective charge in H_2 , N_2 and Ar, at < 10 MeV/a.m.u. 3=1937
 He^3 and He^4 I, liquids, mobility, theory 3=317
 He^{2+} -He charge exchange, resonant 3=16909
 He^+ , charge transfer to O_2 and N_2 3=24224
 He^+ , collisions with H_2 , prod. of Lyman- α radiation 3=6366
 He^+ , ionization by electron impact, calc. 3=14519
 $2\text{He}^+ \rightarrow \text{He} + \text{He}^{2+}$, energy change, rel. to Coulomb repulsion integral 3=22576
 $\text{He}^{2+} + \text{He}^+(1\text{s}) \rightarrow \text{He}^+(1\text{s}) + \text{He}^{2+}$, calc. 3=1938
 HgI_2 configuration, in $(\text{CH}_3)_2\text{S.HgI}_2$ crystals 3=16087
 In^+ above In_2O_3 , mass spectrum 3=12010
 InO^+ above In_2O_3 , mass spectrum 3=12010
 In_2O^+ above In_2O_3 , mass spectrum 3=12010
 K , analysis following Ar^{41} β^- decay 3=19954
 K^+ , in N_2 gas, mobility meas. by "time of flight" apparatus 3=7437
 K^{42} , range in Al 3=12608
 Kr^{86} , 40 keV, range in WO_3 3=22878
 Kr^{86} , range in Al, W, 2-600 keV 3=14675
 Li^+ -Li charge exchange, resonant 3=16909
 Li^{2+} -Li charge exchange, resonant 3=16909
 Mg^{27} , range, from $\text{Al}^{27}(\text{n,p})$ 3=6270
 Mn^{2+} , e.s.r., in SrS 3=5042
 N , mobility and electron-attachment probab. rel. to O_2 and water vapour 3=5624
 N , range in Au, 0.4-6.4 MeV 3=4211
 N_2^+ , absorption coeff., 580-1000 Å 3=25101
 N_2^+ , first negative band intensity behind shock waves rel. to pres. 3=4756
 N_2^+ , formation in presence of He 3=10514
 N_2 , in glow discharges, mass spectra 3=5643
 N_2^{2+} , charge-exchange, dissociation collisions 3=21719
 Na , from β^- -decay of Ne^{23} , electron shake-off 3=15141
 Na^{24} , keV energies, range in Al 3=24385
 Na^{24} , range in Al 3=12608
 NO_2^- in soln., u.v. absorpt. 3=1689
 NO^+ , formation in ion-molecule reactions 3=23539
 O_3^+ above In_2O_3 , mass spectrum 3=12010
 O^- discharge glow, masses, O_3^+ , O^- , O_3^- 3=19183
 O^- from O_2 and CO, mass spectrometric meas. 3=12070
 O_2 , prod. by low-energy electron attachment, cross-section 3=362
 O^- , prod. cross-sections and electron affinity 3=361
 O^{+} , electron impact ionization cross-section 3=5619
 O^{2+} , electron impact ionization cross-section 3=5619
 O^{2+} excitation cross-section 3=4713
 O_2^+ , O^- , O_3^- , O_4^- in pure oxygen 3=7438

Ions—contd

- Rb^{86} , range in Al 3=12608
 Rn^{222} , 2-450 keV, range in Al, W 3=14676
 SF_6 , Townsend discharge, identification, by time-of-flight mass spectrometry 3=16905
 Ti^{3+} , in corundum, e.s.r., theory 3=23237
 UO_2^{2+} , U-O bond force const., from $\text{K}_2\text{UO}_2\text{F}_6$ spectrum, i.r. 3=22575
 W^{187} , range in W, 1.6-127 keV 3=14678
 Xe^{3+} , 4^+ in Ne, charge exchange 3=5630
 Xe -hydrocarbon ions, formation from nuclear decay 3=16183
 Xe^{133} , range in Al 3=12608
 Xe^{133} range in Au 3=12608
 Xe^{133} , range in W and keV energies 3=22876
 Xe^{n+} -Ne, and Xe- Ne^{n+} collisions; ionization 3=2583
recombination
gas, slightly ionized, rel. to electron distrib. function 3=4022
ion-electron-gas atom triple collisions, Fokker-Planck calc. 3=5627
mechanism study in h.f. discharge afterglows 3=7442
molecular, by rotational excitation, theory 3=21715
near metal surface, electron extraction 3=1936
plasma, high-temp., X-ray emission process 3=7503
plasma, non-thermal continua 3=14562
plasmas, optically thick, effect of self-absorpt. 3=364
positive ions lifetimes meas. 3=14664
radiative, causing multielectron excitation 3=7432
in Ar plasma jet 3=24276
Ar, by SF_6 electronegative seeding 3=19237
Ar, out of nozzle, electron-ion recomb. 3=24218
Cs plasma, electron-ion, higher densities 3=21821
H, atomic on Al surface 3=25780
H plasma, three-body, spectr. meas. 3=21771
He, afterglow, very early 3=4065
He ion, electron capture in H_2 , He, A, N_2 , Kr 3=5631
He plasma 3=4106
He plasma, in mag. field 3=14603
in HeII, liquid, β -irrad. 3=5562
in Hg-Ar discharge 3=24236
N and O, NO formation 3=8264
N, afterglow of pulsed d.c. discharge 3=21717
N, atomic, thermal and radiative props. 3=7443
Ne, temp. var. 3=24222
 O^- , on exposure to Ag surface 3=18442
scattering
at collimator slit, calc. 3=5719
collision study methods 3=7439
heavy ions by nuclei, elastic, quasi-classical approx. 3=24978
heavy, on medium and heavy nuclei 3=15232
Ar, 30 keV, ang. distrib., on graphite, Cu, W 3=5720
 Ar^+ , by (100) faces of Cu, Ni 3=13020
 Cs^+ , on hot Mo 3=2047
 H^- ions in O_2 , low-energy collision cross-sections 3=4012
He, stopping cross-section in hydrocarbon gases 3=22133
Mo metal, maximum energies of Rb^+ and Cs^+ 3=22854
 Ne^+ , by (100) faces of Cu, Ni 3=13020
 O^{+} , by C, Mg and Al, elastic 3=19891
 OH^- ions in O_2 , low-energy collision cross-sections 3=4012
 Rb^+ , on hot Mo 3=2047
Ions, electrolytic
See also Conductivity, electrical, electrolytic; Dissociation, electrolytic.
anions, elec. reduction 3=11349
exchange of methanol between solvated cations and solvent 3=8944
in suspensions, colloidal, lamellar, exchange on 3=11364
ionic hydration meas. for 16 ions 3=5435
repulsion by metallic oxides, hydroxides, in dilute solns. 3=13608
transition elements, electron transfer 3=8943
Ag-Zn alloys, transport numbers, various phases 3=11354
 GaBr_3 , Raman spectra study 3=5444
 S^{2-} , interactions with metal ions, in NaF 3=5156
Infrared
See Masers, optical.

Iridium

- field desorption of N and CO, corrosion 3=18386
- field emission, from single crystal tips, obs. by microscope 3=12233
- field emission 3=21855
- thermocouples with noble metals, instability 3=1861
- X-ray L-spectrum, forbidden transitions 3=2566
- Ir⁷⁷, X-ray spectra, L-emission, quadrupole and forbidden lines 3=12762

Iridium compounds

- superconductivity 3=24148
- Ir pentamminebromo complexes, Br^{80m} decay effects 3=23553
- Ir—Os, superconductivity 3=3962
- IrSb₂, crystal structure 3=13518

Iron

- α and γ -phases, interfacial grain-boundary energy 3=13494
- anodic activation 3=13611
- Armco iron, elastic-plastic props. 3=9540
- Armco iron, hardness, effect of electrolytic H 3=3245
- Armco iron, mechanical properties 3=11176
- Armco iron, plastic deformation, mechanism, theory 3=15987
- "Armco" iron, radioactive, electrode potentials 3=16175
- Armco iron, shock-loaded, radiographic study 3=9549
- Armco iron, yield stresses, temp. var. 3=8768
- Armco, plastic deformation mechanism 3=3223
- Armco, plastic flow on explosive loading 3=1224
- atom, localized mag. moment in metals 3=12908
- atom, μ -mesonic, X-ray transition energies 3=6370
- atom, paramag. relax. in K₃Co(CN)₆, freqn. depend 3=25572
- atom, spectral line blackening in hollow cathode 3=19936
- atomic magnetic moment, and sp. ht. discontinuity at Curie pt. 3=23136
- atoms, mesic, μ^- decay anomaly 3=15312
- carbonyl powders, crystal structure, effects of annealing 3=20873
- cast, graphite, formation during cooling from 1000 to 700°C, from u.s. velo. decrease 3=23473
- cast iron, solidification, effects of S 3=11300
- clustering of N impurities in b.c.c. Fe 3=20166
- cold worked, cellular structures within crystals 3=13521
- creep and time-depend. strength, low-temps. 3=18193
- creep, delay times, low C content 3=23335
- creep, rel. to precipitates, 550°-700°C 3=18189
- crystal spheres, sputtering by Kr ions, 1 to 10 keV 3=2051
- crystal structure, number of 3d-electrons 3=8862
- crystals, K-absorption spectra 3=3030
- crystals in tension, dislocations arrangement 3=20198
- Curie pt. thermodynamics 3=13244
- Debye temp. in α -phase by X-ray diffr. 3=17662
- deformation twins, indented surface markings 3=13403
- de Haas—van Alphen effect, internal mag. field for conduction electron 3=20558
- diffusion and microdistrib. of Ce 3=20229
- diffusion in Ag, rel. to solubility 3=13006
- diffusion in β U 3=10691
- diffusion, in liquid, Si, Ti, Va, Nb, by electrolysis 3=5431
- diffusion in pure Au, meas. 3=8449
- diffusion of C, mobility, rel. to pressure 3=20234
- diffusion, self, bulk and intercryst., effect of Ti, up to 1% wt. 3=22812
- diffusion, self, no effect due to Ce 3=22813
- dislocation arrays, electron microscope replica technique 3=17739
- dislocation images by transmission electron microscopy 3=801
- dislocation networks, annealed 3=20200
- dislocation structure in α -phase 3=4875
- domain sizes meas. in polycrystals 3=11074
- domain structure in epitaxial films 3=15830
- elastoplastic waves, prod. by explosion 3=18885
- elec. cond. 0.38°-4.2°K 3=6560
- electrical resistance of hydrogen-charged wires 3=10721
- electron diffraction by reflection, rel. to surface 3=18403
- electron magnetic scattering amplitude 3=1102
- electron scattering, energy loss, rel. to phase transf. 3=2040

Iron—contd

- equations of state, quantum mech. deriv. 3=8373
- eqns. of state and conduction bands, 10⁶ atmos. 3=8372
- exchange integral sign change 3=980
- fatigue limit of strain-aged material 3=8783
- ferromag. props. rel. to band structure 3=8665
- ferromagnetic anisotropy, second const. 3=13246
- Ferromagnetic resonance, single-crystal films 3=15919
- films, absorption, light, oxidation and wavelength effects 3=17991
- films, coercive field strength 3=15810
- films, easy axis magnetization reversal 3=11087
- films, longitudinal Kerr magneto-optical effect 3=13157
- films, magnetic anisotropy, effect of crucible material 3=18082
- films, magnetic props. 3=20600
- films, magnetization distrib. meas. 3=18091
- films, magnetization jumps, magnitude distrib. 3=20599
- films, ~ 100A, conductivity, electrical up to 300°C, and activation energy 3=15538
- films, 1500-2000A, large Barkhausen jumps 3=11080
- films, optical consts. rel. to wavelength 3=10902
- films, Procopin and magnetization effects rel. to thickness 3=3109
- films, spin-wave resonance 3=3155
- films, superconductivity, no evidence 3=19109
- foils, polarization of transmitted electron beams 3=2042
- gamma-ray scatt., ang. and energy distrib. 3=14936
- group elements, X-ray spectra, asymmetry in K α_1 and K α_2 lines, cause 3=8184
- Hall effect and magnetoresistance, anomalous, localized d- electron model 3=827
- Hall effect in single cryst. and polycryst. 3=2853
- hydro-extruded, mech. props. variation 3=1215
- internal friction, 0°-400° C at 1 c/s 3=23287
- internal friction, 250° C, due to dissolved oxygen or not 3=23300
- internal friction peak, 250°C 3=8756
- ions, Fe²⁺, Fe³⁺, in water, electron transfer theory 3=14178
- ions, Fe²⁺, Sternheimer factors, variational calc. 3=2567
- K absorpt. edge for β, γ, δ iron 3=15691
- K β_2 X-ray emission band 3=10976
- lattice stability of b.c.c. and f.c.c. 3=13523
- liquid, surface tension, contact angle, var. with P, S content, 1560°C 3=11775
- liquid, viscosity 3=14115
- magnetic "drag band", rel. to neutron irradiation 3=8469
- use for magnetic electron-microscope lenses 3=2037
- magnetic hysteresis loops, eddy-current broadening 3=15790
- magnetic anisotropy of wires under small torsion 3=20577
- magnetic internal field, Au¹⁹⁷ Mössbauer data 3=6458
- magnetic saturation induction, charged with H 3=6703
- mag. saturation induction, increase by H absorption 3=1145
- magnetic susceptibility at γ/δ and melting point 3=8654
- mag. susceptibility, 1000°C 3=15785
- magnetization, intrinsic, press. depend. 3=6700
- magnetocrystalline anisotropy rel. to field strength 3=20581
- magneto-optical and optical props., i.r. 3=10919
- magnetic props, effects of proton irradiation 3=15863
- magneto-optical effects rel. to optical consts. 3=10918
- magnetic props, neutron effects, very pure 3=23179
- magnetization spontaneous moment rel. to temp., 1.4° to 5°K 3=15792
- martensite—ferrite transition, thermodynamics 3=5120-3
- martensite, in foils, by optical microscopy 3=8890
- mechanical properties, rel. to fast neutron irradi., 4° to 300°K 3=8759
- metal, 3d electrons config. 3=4833
- meteoritic, thermal properties 3=11526
- monocrystals, dislocation distribution by etch method 3=15498
- Mössbauer effect in metallic Fe, 4-1300°K 3=6457
- μ -meson scatt. in 18 in. sample, analysis 3=10138
- n.m.r., longitudinal, model and expt. 3=3197
- n.m.r. of powder, effect of external mag. field 3=1203

Iron—contd

Neel temperature, f.c.c. phase, determ. using
Mössbauer effect 3=23153
neutron damage, electron microscopic obs. 3=8477
neutron form factors; spin density distrib., Hartree-Fock
calc. 3=1103
neutron irradi., relaxation strains 3=20717
neutron scatt., inelastic, critical 3=3120
neutron scatt., polarized, spin wave theory 3=6717
nuclear mag. resonance, up to 65 000 atm 3=11123
nuclear polarization of dissolved Mn²⁺ 3=17636
oxide growths, rel. to surrounding gas 3=18433
particle size and lattice distortions, effect of cold pressing.
by X-ray reflections 3=18401
particles, in Hg, coercivity, effect of other
metals 3=15773
particles, one-domain, mag. props. 3=11088
permeation rates of H₂ and D 3=22815
phase transformations, α - γ , γ - δ , wires, and plastic
deformation, irreversible 3=23471-2
phonon frequ. distrib. of α -phase 3=22641
plastic deformation, single crystals, on rolling,
effect of orientation 3=13359
point defects, rel. to n-irrad. 3=17702
powder, n.m.r., effect of external mag. field 3=1203
powder, sintering rel. to grain boundary
sliding 3=11293
powdered, Bloch wall suppression, n.m.r. study 3=15805
recrystallization texture after cold rolling 3=18353
resistivity, doped Fe, neutron irradi., 78°K 3=13034
sample containers for radioactivity meas. 3=19905
self-diffusion in α , γ and δ phases 3=25290
self-diffusion, surface, after vac. anneal. 3=13003
shear modulus, rel. to deform. amplitude 3=6779
sheets, magnetization depend. of magnetostriction 3=13260
sheets, skin effect 3=831
shock compression up to 9×10^4 atm 3=6786
shock wave damage, due to surface explosion 3=3852
single crystals, growth by zone melting and δ range
heating 3=13420
slip bands after neutron irradi. of α -phase 3=809
slip, zone-melted, unusual 3=10678
specific heats and heats of transform. 3=10598
spectra, Fe III, nonlinear effects in theory 3=8185
sputtering, by Ne⁺, Ar⁺, Kr⁺, Xe⁺ ions, 100-1000 eV 3=4216
in stars, high abundance 3=18641
stress, lattice, residual, on plastic deformation, X-ray
diffr. meas. 3=18180
sun, corona, Fe XIII lines, relative intensities 3=23687
tensile yield stress for two strain rates 3=15991
thermodynamic function derivation method 3=21604
thickness meas. foils, by electron microscopy, using
domain structure 3=5400
thin films, ferromag. res., 9, 18, 24 Gc/s 3=20630
thin films, magnetic props. rel. to evaporation
geom. 3=1070
torsion, 700°-1250°C, microstructural changes 3=6857
whiskers, de Haas-van Alphen effect 3=18060
whiskers, growth by chem. transport 3=5090
whiskers growth by vapour reduction 3=18277
whiskers, orientation and oxidation 3=23412
whiskers, torsional plasticity, 20°K to room temp. 3=8763
wires, internal friction, ageing 3=13333
X-ray spectrum, K-absorption spectrum, fine
structure, effect of W impurities 3=8608
yield and flow stress, rel. to grain size 3=11149
yield and work hardening, neutron effects 3=11168
yield point rel. to temp. and dislocation-intrusion atom
interaction 3=5065
yield points and transient creeps 3=15992
yield points, by reapplication of load at low
temp. 3=11150
 α -Fe, diff. of Au, Co, Ni, effect of ferromagnetism 3=22810
 α -Fe, dislocations, shock wave induced 3=4872
 α -Fe, electron microcharacteristics meas., by
optical constants 3=15467
 α -Fe, kinetics of recovery and recrystallization 3=23484
 α -Fe moving edge dislocations 3=10654
 α -Fe, thermoelec. props., lattice binding
forces 3=2984

Iron—contd

δ -Fe, diff. of Co⁶⁰ and Fe⁵⁹ 3=22811
Fe⁰ atom embedded in Si, e.s.r. 3=20639
Fe II spectra, solar and stellar 3=9201
Fe²⁺, antishielding of mag. and elec. hyperfine
interact. 3=25038
Fe²⁺, e.p.r., in Al₂O₃, 2-80°K, 3 cm 3=20649
Fe³⁺, e.s.r. and spin Hamiltonian in CdWO₄ 3=5040
Fe³⁺, e.s.r. in CaO 3=3181
Fe³⁺, e.s.r., in corundum, temp. depend. 3=5039
Fe³⁺ ion, in corundum, transition matrix elements,
calc. 3=23230
Fe³⁺, line broadening of P³¹ n.m.r. absorpt. in
H₃PO₄ 3=13316
Fe³⁺, paramagnetic resonance spectrum, at room
temp. 3=25571
Fe³⁺, quadrupole antishielding factor 3=12772
Fe⁵⁷ isomeric displacement, interpretation 3=7972
Fe⁵⁷, n.m.r. in Fe₂O₃, temp. dependence 3=8734
Fe-Al-water mixture, neutron transport 3=2272

Iron compounds
See also Ferrites; Steel.
alloys, crystal structure, rel. to annealing 3=8903
alloys, ferromagnetism, Mössbauer effect
studies 3=25521
alloys, superconductivity 3=16873
Alni, ferromag. anisotropy 3=18074
Alnico, powder metallurgy 3=5142
austenite, internal friction, N diffusion and temp.
depend. 3=20695
austenite, supercooled, ferrite grain growth 3=5127
bonds, complex and covalent, Mössbauer study 3=12894
carbonyl, powders, mag. permeab., hysteresis loss
factors 3=11089
cementite (Fe,C), crystal structure 3=5106
cementite, structure 3=23447
chromites in chondrites 3=9186
cronstedtite, polymorphism 3=8854
divalent, trivalent, and alloys, Fe⁵⁷ Mössbauer
shift 3=2699
ferric hydroxides, finely divided, mag. props. 3=3112
ferric oxides, finely divided, mag. props. 3=3112
ferromanganese alloy, γ = ϵ transformation cycles 3=5128
ferrosilicon, creep, rel. to substructure 3=18192
haematite-ilmenite system, Néel temp. calc. 3=18105
ilmenite-hematite solid solutions, synthetic mag. self
reversal 3=18576
ilmenite-haematite system, low temp.,
superparamagnetism 3=8655
Invar, magneto-diffusion, from internal friction,
0-440°C 3=11090
magnetite ferromagnetic resonance 3=23203
magnetite, mag. transformation and domain
structure 3=9138
magnetite, Nernst-Ettinghausen effect, anisotropy 3=23166
magnetite, thermal cond., 5.9°K 3=4829
martensite in Fe-Ni, lattice defects 3=2810
Mössbauer effect of Fe⁵⁷, isomeric shift and quadrupole
splitting 3=22629
paramagnetic susceptibility rel. to temperature 3=13231
Permalloy, complex permeability of tapes 3=15854
permalloy, film, resonance linewidth and
anisotropy, var. 3=13257
Permalloy 66, internal friction, due to ordering 3=11137
pyrite, elastic consts 3=23280
pyrrhotite, remanent mag., field depend. 3=11063
rare-earth garnets, far i.r. spectra and ferrimag.
resonance 3=8597
silicides, specific heat, temp. depend., 55-300°K 3=8360
solid solutions N and C clustering 3=22759
Cu-Fe mixed whiskers, metallography 3=20796
Cu-Ni-Fe, magnetic hysteresis a.c. integrals,
residual to saturation mag., ang. var 3=25526
F-N, cold-worked, interstitial-dislocation inter-
action 3=23293
Fe complexes, nuc. quadrupole interact 3=12905
Fe halide complexes, tetrahedral, spectra 3=15354
Fe orthosilicates, mag. props. 77°-300°K 3=23142
Fe silicides, 3d-electrons of Fe, effect on bonds 3=20041
Fe-rich alloys, liq.-solid and δ - γ equils. 3=13526

Iron compounds — contd

- Fe oxide catalysts, with alkali metals, positive-ion emission, mass-spectrometric study 3=21891
 Fe oxide films, layer structure 3=20928
 Fe oxides, remanent magnetization, pres. effects 3=23156
 Fe silicates, Mössbauer effect 3=8341
 Fe-transition metal dilute alloys, magnetostriction, 4° - 300° K 3=1045
 Fe²⁺ hydrated salts, paramag. behaviour 3=6691
 Fe³⁺-containing crystals, absorpt. spectra 3=15681
 Fe-3% Al alloy, magnetic texture and other props. of sheets 3=15855
 Fe-Al alloys, internal mag. fields and saturation magnetization 3=15734
 Fe-Al alloys, oxidation, around Curie point 3=11337
 Fe-Al, elastic props., rel. to atomic order and ferromag. 3=25605
 Fe-Al films, evaporated, mag. anisotropy and Al source position 3=18084
 Fe-Al, "K-state" and order data 3=23467
 Fe-Al, mechanical strength 3=6798
 Fe-Al, ordering, atomic configs., theory 3=6871
 Fe-Al, ordering kinetics 3=3327
 Fe-Al, reptation and bascule effect 3=1229
 Fe-Al single crystals, magnetic annealing effect rel. to comp. 3=1040
 Fe-Al (16%), twinning, on plastic deformation 3=18236
 Fe-Al, short range order, 300° - 400° C 3=13505
 Fe-Al, steady-state creep 3=15995
 Fe-Al-C alloys, C distribution 3=13525
 Fe₃Al, mag. and elec. props., equil. diag. 3=3326
 Fe₃Al, mag. props. by Mössbauer effect 3=995
 Fe₃Al, magneto-optical res. rel. to d-electron Stark transits, 3=6645
 Fe₃Al, martensitic transformation 3=16102
 Fe₃Al, ordered, internal mag. field 3=8334
 Fe₃Al, ordered, existence confirmation 3=20888
 FeAs₂, cond. elec., temp. var., paramagnetism 3=6601
 FeAsS, cond. elec., temp. var., paramagnetism 3=6601
 Fe-Au, liquidus-solidus and A₄ transform. 3=11285
 Fe-3.8% Au solid solution, Guinier-Preston zones 3=8882
 FeB, paramag. props. (150-800°K) and thermo-electricity 3=1124
 Fe-B-P system, two new ferromag. cpds. 3=1134
 FeBr₂, crystal structure, powder, 400° C 3=25710
 Fe-C alloys, α -tempered, carbide pptn. 3=13539
 Fe-C alloys, creep and lifetime under load, at high temps. 3=6791
 Fe-C alloys, mag. susceptibility, austenitic, C up to 0.97% 3=15785
 Fe-C, austenite, isothermal transform. 3=11286
 Fe-C, diffusion, by neutron irradi., internal friction meas. 3=10702
 Fe-C, kinetics of C pptn. 3=6867
 Fe-C, precipitation of C rel. to radiation-produced defects 3=22866
 Fe-0.03%C, precipitation, rel. to Nb addition 3=20899
 Fe-C, quench-aged, structure 3=20903
 α -Fe-C solid soln. screw dislocations, form. of Shock's regions 3=20177
 Fe-C, strain ageing, electron transmission study 3=3232
 Fe-C whiskers, orientation and oxidation 3=23412
 λ -Fe₂- γ -C, cryst. structr. by electron diffraction 3=1324
 ϵ -Fe₂- γ -C, cryst. structr. by electron diffraction 3=1324
 θ -Fe₃C, cryst. structr. by electron diffraction 3=1324
 Fe₃C, crystal structure, atomic, by electron diffraction 3=20867
 Fe₃C, ferromag. domain structures 3=23163
 Fe₃C, interplanar spacings, tables 3=13455
 FeCl₃ aq. soln., proton spin resonance freq. 3=2140
 FeCl₂·4H₂O; Fe⁵⁷ Mössbauer absorption pattern quadrupole splittings 3=996
 FeCl₂, neutron small-angle scatt. near Néel temp. 3=11035
 Fe-Co alloy, one-domain particles, mag. props. 3=11088
 Fe-Co alloys, γ -phase, antiferromag. phase 3=3146
 Fe-Co alloys, mag. props. and electron band structure, effect of Mn substitution 3=15784
 Fe-Co alloys, magnetostriction, forced. meas. 3=1046

Iron compounds — contd

- Fe-Co alloys, order-disorder, neutron diffraction investig. 3=1355
 Fe-Co, atomic ordering, by neutron diffraction 3=13506
 Fe-Co ferrites, induced anisotropy and disaccommodation phenomena 3=1032
 FeCo ferrites, rotational hysteresis, domain dynamics 3=13269
 Fe-Co, forced magnetoresistance 3=13042
 Fe-Co, mag. moment distrib. meas. 3=18098
 FeCo, magneto-optical res. rel. to d-electron Stark transits 3=6645
 Fe-Co, Mn substituted, electron structures 3=4839
 Fe-Co, ordering, recrystallization meas. 3=11296
 Fe-Co particles, magnetic props., effect of Co 3=15850
 Fe-Co, phase transformation, order-disorder, neutron diffraction exam. 3=23478
 Fe-Co, soft X-ray M₂₃ emission spectra 3=25476
 Fe-Co ternary alloys, saturation moments and residual resist. 3=3103
 FeCO (siderite), Néel point 3=15749
 FeCO₃, specific heat, 1.6° to 70° K, rel. to antiferromag. transition 3=17659
 Fe(CO)₅, bond length shortening, theory 3=10497
 Fe(CO)₅, liquid, i.r. spectrum, low-frequency 3=23883
 Fe-Co-Ni alloys, Curie temp. prediction 3=11025
 Fe-Co-Ni alloys, magnetic anisotropy 3=1097
 (Fe,Co),P alloys, Curie temps. and coercivities, ground to diff. degrees of fineness 3=15786
 Fe-Co-V, anhysteretic suscept. 3=1144
 Fe-Cr, crystallization of supercooled alloy system 3=21624
 Fe-Cr, damping capacity and elec. resist. 3=5060
 Fe-Cr, Hall effect 3=2853
 Fe-Cr, heat of alloying 3=24097
 Fe-Cr, single crystal, tensile props. 3=11156
 Fe-Cr, thermoelec. props., lattice binding forces 3=2984
 Fe-Cr-C, austenite-martensite transform. 3=18346
 Fe-Cr-Ni alloy films, phase transformations 3=23474
 Fe-Cr-Ni, plastic deform. and martensitic transform. 3=20883
 Fe-Cr-Ni, stacking faults 3=12987
 Fe-Cu alloys, creep and lifetime under load, at high temps. 3=6791
 FeF₃, mag. anisotropy const. calc. 3=8658
 FeF₃, mag. props. by Mössbauer effect 3=995
 Fe-Ge, paramag. and lattice parameters 3=11030
 Fe_xGe (1.5 \leq x \leq 2.0) sat. mag. mom. rel. to x 3=1005
 Fe-Ir, liquidus-solidus and A₄ transform. 3=11285
 Fe-Mn alloys, antiferromagnetism 3=6733
 Fe-Mn alloys, antiferromagnetism in f.c.c. and h.c.p. phases 3=15907
 FeMn ferrite, 1st anisotropy const., mag. structure, temp. depend. 3=13273
 Fe-Mn, liquid, magnetic susceptibility 3=3816
 Fe-Mn, thermoelec. props., lattice binding forces 3=2984
 Fe-Mn-C foils, martensite nucleation 3=23475
 Fe-Mn-C, strain ageing, electron transmission study 3=3232
 Fe-Mn-Zn ferrites, permeability, anisotropy 3=20619
 FeMo, crystal structure 3=13492
 Fe-Mo solid solutions, X-ray spectra fine structure rel. to binding forces 3=5141
 Fe-N alloys, hexagonal structure, and effect of hybrid bonding orbitals 3=8884
 Fe-N, quench-aged, structure 3=20903
 Fe-N, strain ageing, electron transmission study 3=3232
 Fe₄N, mag. structure, by X-ray scatt. 3=8846
 Fe(NH₄)₂(SO₄)₂·6H₂O; Fe⁵⁷ Mössbauer absorption pattern quadrupole splittings 3=996
 Fe(NH₄)₂(SO₄)₂·12H₂O, e.s.r. 3=25565
 Fe-Ni alloy, dissociated dislocations, obs. 3=17767
 Fe-Ni alloy films, magnetostriction 3=11084
 Fe(50%)-Ni alloy, magnetic anisotropy energy rel. to electron irradi., 280° C 3=3119
 Fe-(17.2 at%)Ni alloy, repeated twin observation 3=1315
 Fe-Ni alloys, complex permeability of tapes 3=15854
 Fe-Ni alloys, corrosion layers, formation and structure 3=20913

Iron compounds — contd

- Fe-Ni alloys, defects, irradiation-induced interaction with mag. structure 3=22729
 Fe-Ni alloys, hyperfine field and Ni⁶¹ n.m.r. 3=15967
 Fe-Ni alloys, Invar type, variation of thermoelasticity 3=25607
 Fe-Ni alloys, mag. props., effect of pressure 3=3097
 Fe-Ni alloys, mag. props., effect of pressure 3=6699
 Fe-Ni alloys, magnetic moments and degree of order 3=1106
 Fe-Ni alloys, magnetization effect of uniaxial tension and compression 3=3102
 Fe-Ni alloys, magnetization rel. to composition 3=8670
 Fe-Ni alloys, magnetostriction, forced, meas. 3=1046
 Fe-Ni alloys, magnetostriction rel. to elastic stress 3=1062
 Fe-Ni alloys, order-disorder, neutron diffraction investig. 3=1355
 Fe-Ni alloys, saturation magnetization, rel. to volumetric compression 3=8668
 Fe-Ni, antiferromag. props. 3=6734
 Fe-Ni, crystallization of supercooled alloy system 3=21624
 Fe-Ni, electroplated, mag. props. 3=13259
 Fe-Ni, f.c.c., two electronic structures 3=20114
 Fe-Ni 50/50% alloy, texture and recrystallization, rel. to grain size and impurities 3=16112
 Fe-Ni films, domain structure rel. to temp. 3=11081
 Fe-35%Ni films, Faraday rotation 3=13156
 Fe-Ni films, ferromagnetic anisotropy 3=11082
 Fe-Ni films, martensitic transform. 3=20884
 Fe-Ni, fine structure after martensitic transform. 3=20866
 Fe-Ni foils, martensite nucleation 3=23475
 Fe-Ni, H permeability, rel. to work hardening 3=18344
 Fe-Ni, heat of alloying 3=24097
 Fe-Ni, in fine particles, phase transformation 3=8897
 Fe-Ni, Invar, internal friction, rel. to magnetic diffusion 3=15977
 Fe(50%)-Ni(50%), magnetic anisotropy and phase ordering rel. to neutron irradiation 3=11056
 FeNi magnetic moment distrib. 3=1110
 Fe-Ni, order-disorder transition 3=8900
 Fe-Ni, plastic deform. and martensitic transform. 3=20883
 Fe-Ni, short-range mag. order study 3=25522
 Fe-Ni solid solutions, electronic specific heat 3=8367
 Fe-Ni, stacking faults 3=12987
 Fe-Ni, thermal and elec. cond. in mag. field, low temp. 3=8489
 FeNi₃ magnetic moment distrib. 3=1110
 FeNi₃, thermoelectric power, change due to mag., and magnetostriction 3=13262
 Fe-Ni-Al solid solution, decomposition, initial stage 3=20909
 Fe-Ni-Al-(Co) alloys, thermomagnetic treatment meas. 3=25524
 Fe-Ni-Cr, anhysteretic suscept. 3=1144
 Fe-Ni-C system, solid soln. thermodynamics 3=5117
 Fe-Ni-Cr-Ti system, χ -phase of α -Mn structure 3=3314
 Fe-Ni-Mn, antiferromag. ordering 3=13284
 Fe-Ni-Mo alloy, crystalline magnetic anisotropy 3=25538
 Fe-Ni-Mo alloy, mag. props. 3=20600
 Fe-Ni-Mo films, domain structure rel. to temp. 3=11081
 Fe(17%)-Ni(79%)-Mo(4%) films, ferromagnetic anisotropy 3=11082
 Fe-Ni-Mo films, 1500-2000A, large Barkhausen jumps 3=11080
 FeO layer between Fe plates, electrolytic deposition 3=25831
 FeO, phase transformations 3=11200
 FeO, vacancy interaction energy 3=2785
 FeO-Fe₂O₃-TiO₂, ferromag. props. as basis of rock magnetism 3=1497
 α -Fe₂O₃-Al₂O₃, mag. susceptibility 3=18077
 Fe₂O₃, α -phase, mag. transformations 3=5029
 Fe₂O₃, α -phase, particles 20-400 A diam., mag. props. 3=3137
 Fe₂O₃-BaO, phase equilib. 3=6812
 Fe₂O₃, crystal growth, Pb pyrophosphate as flux 3=5083

Iron compounds — contd

- α -Fe₂O₃, diffusion of Fe⁵⁹ 3=22807
 γ -Fe₂O₃, ferrimagnetism, origin, by quenching and pressure squeezing 3=1024
 α -Fe₂O₃, ferromagnetism, parasitic, exptl. study 3=1021
 γ -Fe₂O₃, ferromag. resonance in single-domain particles 3=6741
 α -Fe₂O₃ fine grains, mag. suscept., rel. to diam., 20 to 400 A 3=1094
 α -Fe₂O₃ fine grains, superparamag. and superantiferromag. props. 3=1093
 α -Fe₂O₃, fine particles, antiferromagnetic properties 3=8697
 γ -Fe₂O₃ fine particles for recording media, coercivity and remanence curves 3=1091
 Fe₂O₃, $\gamma \rightarrow \alpha$ phase transformation 3=11204
 Fe₂O₃, growth of filaments and plates 3=3268
 γ -Fe₂O₃, gyromagnetic resonance, 9500 Mc/s 3=23201
 α -Fe₂O₃ (haematite), domain structure, neutron scatt. study 3=15859
 α -Fe₂O₃, mag. props. 3=25523
 α -Fe₂O₃, mag. props. by Mössbauer effect 3=995
 α -Fe₂O₃, mag. props., temp. effects 3=20575
 γ -Fe₂O₃ micropowders, ferrimag. resonance 3=1175
 α -Fe₂O₃, natural and synthetic, antiferromag. and ferromag. props 3=1019
 Fe₂O₃, remanent mag., field depend. 3=11063
 α -Fe₂O₃, remanent magnetic memory effect in low-temp. transition 3=1020
 γ -Fe₂O₃, thin film, remanent magnetization 3=13256
 α -Fe₂O₃ ultra fine particles, antiferromag., susceptibility meas. 3=1095
 γ -Fe₂O₃ vacancy distrib. 3=787
 5Fe₂O₃ x La₂O₃ (3-x) Y₂O₃, absolute saturation magnetization and remanence 3=1047
 5Fe₂O₃ x Nd₂O₃ (3-x) Y₂O₃, absolute saturation magnetization & remanence 3=1047
 Fe₃O₄, compressed powder, remanent mag. 3=1498
 Fe₃O₄, Fe⁵⁷ n.m.r., temp. dependence 3=8734
 Fe₃O₄ films, magnetization meas., by electron diffr. 3=23181
 Fe₃O₄- γ -Fe₂O₃- α -Fe₂O₃, mag. and dielectric props., 10²-4 x 10⁶ c/s 3=18071
 Fe₃O₄, mag. props. by Mössbauer effect 3=995
 Fe₃O₄ magnetic crystal structure 3=1148
 Fe₃O₄, magnetocryst. anisotropy meas. 3=20582
 Fe₃O₄, Nernst-Ettinghausen effect, longitud. 3=25532
 Fe₃O₄, remanent mag., field depend. 3=11063
 Fe₃O₄, specific heat, spin-wave contrib. 3=25200
 Fe₃O₄, spin-wave dispersion curves eval. 3=1152
 Fe₃O₄, spin wave spectra calc. 3=15782
 Fe₃O₄, spin waves, neutron scatt. 3=3120
 Fe₃O₄, Zeeman splitting, 85° and 300°K 3=994
 β -FeOOH colloidal crystals, structure 3=18408
 β -FeOOH, micro-morphology 3=1333
 Fe-Os, liquidus-solidus and A₄ transform. 3=11285
 Fe-P, liquid, magnetic susceptibility 3=3816
 Fe-P, liquid, surface tension, contact angle, var. with P content, 1560°C 3=11775
 FeP, mag. props, Curie pt. and absolute moment 3=1018
 FeP₂, antiferromag. props. 3=1018
 FeP₂, mag. props., Curie pt. and absolute moment 3=1018
 Fe₂P, mag. props, Curie pt. and absolute moment 3=1018
 Fe₃P, mag. props, Curie pt. and absolute moment 3=1018
 Fe₃(PO₄)₂.8H₂O, n.m.r. line splitting 3=1206
 Fe-Pd alloys, γ -phase; Invar behaviour and mag. moments 3=998
 Fe-Pd alloys with low exp. coeffs. 3=2734
 FePd magnetic moment distrib. 3=1110
 FePd, magnetic moment distrib. 3=1110
 Fe-Pt alloys, γ -phase, antiferromag. props. 3=3146
 Fe-Pt alloys, magnetostriction, forced, meas. 3=1046
 Fe-Pt, forced magnetoresistance 3=13042
 Fe-Re, nucl. mag. sp. ht., mag. field at Re nuclei 3=6479
 Fe-Rh, hyperfine fields, Mössbauer study 3=17632
 Fe-Rh system, hyperfine fields and mag. moments 3=15733
 Fe_{0.4}Rh_{0.6}, mag. moments, localized, by neutron diffr. 3=15856
 FeS, dissociation energy D₀ < 77 kcal/mole 3=25806
 FeS in chondrites 3=9186

Iron compounds—contd

- Fe—S, liquid, surface tension, contact angle, var. with S content, 1560°C 3=11775
- FeS_{1.00}, mag. props. by Mössbauer effect 3=995
- FeS_{1.00±0.05, 1.07}, h.f.s. of Fe⁵⁷ 3=2698
- FeS_{1.33}, ferrimagnetism, origin by quenching and pressure squeezing 3=1024
- FeS₂, Brillouin zone, wave vector groups 3=12949
- Fe_{0.998}S, magnetic and struct. props. by neutron diffraction 3=1023
- Fe₇S₈, magnetocrystalline anisotropy 3=1025
- Fe₂S₃ (pyrrhotite), magnetic props. 3=15788
- Fe—Sb, nucl. mag. sp.ht., mag. field at Sb nuclei 3=6479
- Fe—Se alloy, "accommodation zone" structure 3=16025
- Fe₂S₃, ferromag. resonance absorpt. 3=13288
- FeSO₄·H₂O, crystal structure 3=18327
- FeSO₄·7H₂O, crystal structure 3=6850
- FeSO₄·7H₂O; Fe⁵⁷ Mössbauer absorption pattern quadrupole splittings 3=996
- FeSO₄·7H₂O, mag. props. by Mössbauer effect 3=995
- FeSO₄·7H₂O, u.s. velocities, elastic consts., and structure 3=20690
- Fe₇Se₈, magnetocrystalline anisotropy 3=1025
- Fe—Si, $\alpha = \gamma$ phase transform., rel. to volume changes 3=5124
- Fe—3% Si, Bloch wall energy 3=15802
- Fe—Si, crack propag. obs. and analysis 3=13379
- Fe—Si, cryst. orientation meas. by etching 3=8873
- Fe—(3.1-3.6%) Si, deformation twins 3=17778
- Fe—Si, disaccommodation, effect of temp. 3=8653
- Fe—3% Si, dislocations after plastic deform. 3=20176
- Fe—Si, ellipsoidal, mag. shape effects 3=3116
- Fe—Si, foils pren. for electron microscopy 3=11330
- Fe—Si, forced magnetoresistance meas. 3=22905
- Fe—Si (4%), domain wall velo., effect of plastic deformation and irradiation 3=11068
- Fe—Si, frame-type crystal, magnetic disaccommodation 3=1044
- Fe—3% Si, grain growth obs. 3=18360
- Fe—Si, Hall effect 3=2853
- Fe—Si, internal mag. fields of Fe⁵⁷ sites 3=8335
- Fe—Si, lattice expansion and volume change 3=10602
- Fe—3% Si, mag. domain structure, effect of compression 3=13263
- Fe—3% Si, magnetic annealing and directional ordering 3=15804
- Fe—Si, magnetic diffusion after-effect 3=8660
- Fe—Si, magnetic diffusion after-effects 3=1043
- Fe—(3%) Si, magnetic relaxation rel. to neutron-irrad. 3=1042
- Fe—Si, magnetostriction and grain interaction 3=5016
- FeSi, neutron diffrn. search for antiferromag. props. 3=25543
- Fe—Si (1.05, 4.10%) alloys, magnetostriction, linear, effect of shape 3=6712
- Fe—Si rolled strips, brittleness anisotropy 3=3238
- Fe—Si sheet, magnetostriction 3=8679
- Fe—Si sheets, reptation and bascule effects 3=23158
- Fe—Si sheets, secondary grains, growth 3=16108
- Fe—Si sintered alloys, mag. props., processing effects 3=3118
- Fe—Si(3%), magnetization process, Néel theory, temp. var. 3=20586
- Fe—Si 3.25%, plastic deformation processes 3=20713
- Fe—3% Si, var. of crystal orientation and mag. prop. with field and rolling direction 3=6704
- Fe—Si, ξ -phase, transformations 3=6859
- Fe₂Si, Fe₃Si, mag. study by Mössbauer effect 3=23180
- FeSi₂—4% CoSi₂ alloy, thermal conduct. 3=5547
- Fe₃Si, mag. moment rel. to sublattice metallic and covalent nature 3=1005
- Fe—Sn, electron microscope exam., by replica, Cr—C 3=18426
- FeSn₂, antiferromagnetism, neutron diffraction study 3=1111
- Fe_{1.3}Sn, mag. moment rel. to sublattice metallic and covalent nature 3=1005
- Fe—Tc, liquidus—solidus and A₁ transform. 3=11285
- FeTiO₃— α Fe₂O₃, ferrimagnetic props. 3=3133
- FeTiO₃—Fe₂O₃, reverse thermoremanent magnetism 3=1496

Iron compounds—contd

- FeTiO₃—Fe₂O₃, reverse thermoremanent mag. 3=13255
- xFeTiO₃(1-x)Fe₂O₃, hematite, Curie pt. detm. 3=1098
- (1-x)FeTiO₃—xFe₂O₃, mag. props. at low temp. 3=1022
- (1-x)FeTiO₃—xFe₂O₃, solid solns., ferrimag. anomalies by Mössbauer effect 3=997
- FeVO₄, high-pressure form, atomic structure, from X-ray diffr. 3=11270
- NiCoFe, electrochemical test for distinguishing from W and Mo 3=9311
- Ni—Fe layers, evaporated, composition 3=18377
- Si iron, ferromagnetic resonance linewidth 3=8700
- Si—iron, magnetic texture rel. to stresses 3=8663
- Si—Fe alloy, mag. domains band structure 3=1147
- Si—Fe, containing C, diffusion after-effects 3=13254
- Si—Fe, crystal structure, rolled and annealed, "microband" contrast difference between, sub-grains 3=25739-40
- Si—Fe crystals, deformation bands, by electron microscopy 3=8912
- Si (3.5%)-Fe, domain structure, 0-600°C, from longitudinal Kerr effect 3=11071
- Si—Fe, eddy-current losses, calc. from domain wall data 3=15800
- Si(2-4%)-Fe, heat treatment, carbide formation and coercive force 3=16101
- 3% Si—Fe, initial mag. curve, tension effects 3=25527
- Si—Fe, mag. surface microfields 3=2075
- Si—Fe, sheet, transformer, recrystallization texture and mag. props., after annealing 3=16098
- Irradiation effects**
See Biological effects of radiations; Chemical effects of radiations; Physical effects of radiations.
- Isomerism**
See also Nuclear isomerism.
- butene-2, cis-trans isomerization in shock tube 3=16160
- butyronitrile, rotational 3=6409
- difluorodiazine, heats of formation of isomers 3=8960
- isomerization of isobutyl radicals 3=8948
- polymers, stereo, and transitions 3=20037
- n-propyl chloride, trans and gauche, energy difference 3=25130
- substituted benzaldehyde an ions, rotational, e.s.r. study 3=15373
- tetramethyl-1,3-cyclobutanedione 3=17606
- unimolecular reaction theory for vibr. excitation 3=3386
- vapour pressures of cis-, gem-, and trans-dideuteroethylenes 3=8247
- F₂HC—CDHF, stability, from spectrum 7-25 kMc/s, Stark modulation
- HNO₃, isomerization, i.r. photochem. reaction 3=16159
- Isotope effects**
crystal structure, atomic, temp. var., review 3=23439
- enrichment coeff. meas., Rayleigh and differential methods 3=15307
- hydrocarbon gases, ionization, by beta-rays, H—D 3=19171-2
- intermolecular interactions and vap. press. 3=22614
- isotope shifts, second-order contribs. 3=8216
- masses, from Sr to Ru 3=4728
- methane and deuterioforms, mass spectra, metastable transitions 3=25148
- molecules, vibrational frequencies 3=10493
- in nonequilibrium reaction systems 3=16154
- organic compounds, spectra, H—D 3=25114
- photochlorination of H₂, CH₄, CHCl₃, and C₂H₆ 3=11356
- primary intramolecular kinetic isotope effect in nonequilibrium system 3=11347
- pyrolysis of cyclopropane and cyclobutane 3=8961
- shift of γ -ray internal conversion in medium and heavy nuclei 3=6151
- solid—vapour and liq.—vapour equilibria 3=21611
- solution of O₂ and N₂ in H₂O 3=9450
- spectral lines, isotropic shift 3=25040
- trapped H and D atoms in γ -irradiated ice 3=2669
- unimolecular decomp. of chem. activated propyl radicals 3=20993
- in unimolecular decomposition of activated ethyl-d radicals 3=16154
- vapour pressure changes due to mol. mass distrib. 3=19073

Isotope effects—contd

- vapour pressure, expt. and theory review 3=21631
- vapour pressure, rel. to mol. structure 3=21632
- vapour pressures of isotopic molecules 3=8247
- vapour pressures of isotopic molecules 3=8248
- $B^{10}F_3$ — $B^{11}F_3$, enrichment coeff. meas., Rayleigh and differential methods 3=15307
- $C^{12}H_4$ — $C^{13}H_4$, enrichment coeff. meas., Rayleigh and differential methods 3=15307
- $Cd^{107,9,11,13}$, ^{32}S h.f.s. and isotope shifts 3=25049
- D, in reactions of $Hg^{199}(P_1)$ with propane 3=8973
- D substitution, effect on glass transform. temp. of aq. inorganic soln. 3=23492
- H, D in UH_3 , UD_3 , effect on magnetothermal effects and magnetization per mol. 4-2°, 77-4K 3=8673
- H_2 — H_2^+ reaction, isotopic fractionation 3=2677
- Hg, spectrum, 2537 Å 3=22484
- K^{40} detection, by optical alignment 3=15296
- N_2^{15} spectrum, u.v., anomalous 3=25102
- Ne, 1.15 μ $2p_4 \leftarrow 2s_2$ 3=19944
- Rb optical alignment, temp. var. 3=15295
- Rh, superconducting, absence of effects 3=3963
- Sm, spectra shift 3=15294
- W^{183} , e.p.r., h.f.s. in glasses, silicate and phosphate 3=20656
- Yb I, isotope shift in λ 5556 Å 3=8196

Isotope exchanges

- BF_3 , with diethyl ether and tetrahydrofuran complexes 3=15361
- CO—Ni (CO)₄ system 3=3380
- Lu, masses, meas. with mass-spectrometer 3=4727
- N_2O_2 —NO, N isotopes, at low temp. 3=13592
- O + $NO_2 = NO + O_2$, isotope 3=18436
- T—H, transition-metal catalyst 3=19800

Isotope separation

- See also Radiochemistry.
- columns, optimum operating conditions calc. 3=22512
- diatomic mol., by adsorption, theory 3=22513
- by elec. field, recoil products of $Br(n,\gamma)$ and $I(n,\gamma)$ 3=8110
- electromagnetic, electron-impact ion source 3=16990
- electromagnetic, factors affecting focus 3=16991
- e.m. separator for wide energy interval 3=12788
- e.m. separator, 90° sector contamination props. 3=12787
- e.m., with small mag. field volume, novel beam optics 3=12786
- enrichment coeff. meas., Rayleigh and differential methods 3=15307
- gas, expanding supersonic jet 3=5459
- gas jet method, with light added gas 3=5460
- in gas under uniform field of force 3=7238
- molecular pump, separation factor and potential 3=22514
- SGAE electromagnetic separator, applications 3=24886
- separate tube cascades, math. transformation principle 3=15308
- Ar, by expanding supersonic jet 3=5459
- Ar, by jet method, with light added gas 3=5460
- $B^{10}F_3$ — $B^{11}F_3$, enrichment coeff. meas., Rayleigh and differential methods 3=15307
- $C^{12}H_4$ — $C^{13}H_4$, enrichment coeff. meas., Rayleigh and differential methods 3=15307
- D_2/H_2 , permeation through Fe 3=22815
- H, distillation of nitric acid—water azeotrope 3=715
- Kr isotopes, in 90° sector e.m. separator 3=12787
- Ne— nD_2 liquid systems, phase separation 3=3801
- $Si^{28,29,30}$, by thermal diffusion of SiH_4 in column 3=25072
- U, nozzle, by adding He 3=15309

Isotopes

- gas mixture, β -active, det. using ionization chambers 3=6187
- nuclear binding energy, from Sr to Ru 3=4728
- tables of props. 3=2146
- $Cd^{107,9,11,13}$, ^{32}S , h.f.s. and isotope shifts 3=25049
- Er^{159} 3=4597
- H^3 , from Li^7 — γ reaction 3=12620
- Ho^{165} , discovery from γ spectroscopy, half life 3=8048
- $Kr^{82,84}$, saturated vapour press. diff. 3=21633
- $Li^{6,7}$ liquid, viscosity 3=125
- Pt^{160} , α -particle energy and spectrum 3=4602
- $Te^{122,4,6,8,130}$ mass diffs., neutron separation energies 3=22336

Isotopes—contd

- Tm, masses, meas. with mass-spectrometer 3=4727
- Yb, masses, meas. with mass-spectrometer 3=4727
- Xe^{130,136}, saturated vapour press. diff. 3=21633

detection

- See also Mass spectra; Radioactivity.
- mass spectrometer for ratio analyses 3=1407
- D_2O in H_2O , i.r. analysis 3=23561

relative abundances

- See also Elements, relative abundances.
- mass-abundance ratiometer for single-beam spectrometer 3=21904
- Ne^{20}/Ne^{22} ratio, by mass spectrometer 3=454
- O, mass-spectra 3=12785
- O^{17}/O^{18} in mass spectrometers, accurate formula 3=25071

Jets

- See also Sprays.
- acoustic tones prodn., choked axisymmetric jet 3=1767-8
- adiabatic, Howard's circle theorem 3=21294
- air, oscillations and sound emission 3=1769
- air, turbulence energy spectra at high Reynolds number 3=5454
- aircraft exhaust, noise spectra and directivity 3=11873
- barotropic divergent fluid, stability 3=16216
- choked axisymmetric, cell structure during acoustic radiation 3=1767-8
- coaxial, for miscible fluids, turbulence theory 3=105
- current-carrying, from nozzle, instability 3=21950
- flow, supersonic, air into water 3=7226
- gas, in arc, electric, temp. equilib., meas., spectral 3=21754
- gas, for isotope separation 3=5459
- gas, for isotope separation, with light added gas 3=5460
- gas, shock, oblique, acoustic radiator 3=16703
- gaseous, collision, plane problem 3=16646
- motion, two-dimensional, in incompressible pseudoplastic fluid 3=14109
- penetration of shaped-charge jets 3=11194
- plasma, arc-heated, temp. distrib. 3=21810
- plasma injection from pulsed discharge into vacuum 3=1996
- plasma, stable, formation, with force-free mag. fields 3=7560
- supersonic, ideal dissociating gas 3=11815
- transverse sonl., interaction with supersonic stream 3=7229
- two-dimensional, prod. by flow past obstacles, theory and expt. 3=104
- A plasma, elec. and optical studies 3=24276
- Hg, current-carrying, instability 3=21950

Joule—Thomson effect

- and corresponding states principle 3=14211

Kerr effect

- See Electro-optical effects; Magneto-optical effects.

Kinematics

- accelerations, induced in tangential coords, theory 3=16563
- Newtonian eqns. of motion rel. to Einstein grav. theory 3=23758
- relativistic and classical, common postulates 3=16508
- rigid body motion in Newtonian force field 3=23822
- two-particle system, relativistic 3=11674
- unilateral constraints and appl. of Gauss' principle 3=9388

Kinetic theory

- Boltzmann eqn., asymptotic theory 3=9500
- Brownian motion in fluid, dynamical study 3=23772
- condensation transfer between two surfaces 3=14427
- dissociation of diatomic mol., model 3=6422
- fluid of hard spheres, triplet distrib. function 3=21435
- formal and asymptotic solns. 3=9501
- Percus—Yevick eqn. for radial distrib. function 3=14095
- plasma, fully ionized, inhomogeneous 3=16925

Kinetic theory — contd

- plasma, with large radiation press. and electron-photon drag 3=21782
- plasma, quantum, derivation 3=21759
- plasma, weakly nonequil., wave interact. 3=21844
- radial distrib. function, asymptotic behaviour 3=11722
- shock wave, Boltzmann eqn. 3=21478
- shock waves, Boltzmann eqn. soln. 3=14244
- shock wave, plane, structure 3=1754
- surface tension rel. to curvature 3=14052
- vaporization and condensation, thermodyn. 3=19070
- vapour—liquid equil., van der Waals theory 3=12005
- vapour—liquid equil., van der Waals theory 3=12006

gases

See also Association, gases; Brownian movement; Collision processes; Diffusion in gases; Equations of state, gases; Joule—Thomson effect; Molecules, intermolecular mechanics.

- appl. to vacuum techniques, acoustics and photometry 3=9499
- binary mixtures, thermal diffusion 3=18843
- binary mixtures, viscosity, 2nd approx. determinant elements 3=21438
- Boltzmann eqn., elementary solns., appl. to slip-flow 3=3826
- Chapman—Enskog and mean-free-path theories, equivalence 3=1726
- charged-particle gas, relativistic theory 3=3830
- classical gases, three-particle scattering operator 3=7240
- condensation, for various force laws 3=24115
- conductive heat transfer from fine wire 3=1848
- corresponding states law 3=21433
- dense, nonequilibrium, statistical mech. 3=11828
- diatomic, thermal accommodation coeffs., quantum theory 3=23928
- effusion through conical orifices, theory 3=18851
- elementary treatment for teaching 3=14207
- flow, molecular, through tubes, diffuse wall reflection 3=16648
- fourth virial coefft., limits w.r.t. temp. 3=18848
- free-mol. expansion into vacuum, temp. variation 3=3828
- gas mixtures, modelling 3=11830
- harmonic oscill. vibr. contribs., calc. tables 3=23926
- ideal dissociating gas, Prandtl—Meyer expansion 3=21439
- imperfect, thermodyn. props. and correl. functions 3=14208
- inert gases, electron distrib. functions, transport coeffs. 3=5628
- ionized, Fokker—Planck diffusion term 3=9374
- ionized, irreversible processes. 3=170
- irreversible processes in ionized gases 3=18847
- loaded spheres 3=16654
- mean free path, air, teaching meas. 3=21425
- mixtures, second virial coeff. of refract. 3=3835
- mixtures, viscosity and thermal conductivity formulae 3=11829
- moderately dense, inverse power pots. 3=18846
- nonspherical molecules 3=16653
- paramagnetic gas in magnetic field. 3=171
- partial pressures, on mixing, and entropy, Gibbs theorem 3=21442
- polyatomic mixtures, transport phenomena 3=21437
- polyatomic, rotational relaxation, rel. to molec. square-well potential interactions 3=1724
- pumping at solid surfaces 3=21454
- quantum virial expansion, rel. to lifetime matrix 3=23766
- rarefied gases, conference 3=11813
- real gases, collision lifetimes and thermodynamics 3=9496
- refractive index, complex, of monatomic gas 3=1733
- relativistic, four-dim. geometric approach 3=23927
- relativistic gas in gravitational field 3=21215
- rough spheres, relaxation effects in transport props. 3=9495
- sampling through pinhole 3=21441
- second virial coefficient, effect of quadrupole moments 3=21436
- spherical particle of comparable size to mean free path, motion 3=169

Kinetic theory — contd**gases — contd**

- shear flow for gas mols. 3=9498
- square-mound potential, fourth virial coefft. 3=1721
- stream gas dynamics 3=18837
- thermal diffusion, analysis 3=9493
- thermal diffusion for binary mixture 3=11818
- third virial coefft. at low and high temps. 3=7239
- three-particle scatt. operator, structure 3=11827
- transport coeffs., density expansion 3=3829
- transport processes, Maxwell—Chapman method 3=3825
- in uniform field of force, effect on concn. 3=7238
- He, 2nd virial coeff., high temp. 3=21440
- N₂, rotation excit. by electrons, energy loss 3=17578

liquids

See Liquids, theory.

Krypton

- absorption coeffs. 600-886 Å 3=23934
- adsorption on NaBr, statist. mech. study 3=3367
- arc, electric, 2 atm., radiative function 3=14555
- atom, (4p)⁴(5s)¹ ³P₂ state, h.f.s. 3=8186
- atom, scatt. by Li, interact. potential eval. 3=15305
- atoms, excitation of Hg, Xe, in discharges, by collisions 3=19190
- boiling and triple points, detm. 3=9659
- collisions with light element (Z=2 to 18) ions, electron loss 3=7448
- continuous spectra, behind shock wave 3=14218
- diffusion factor, thermal, trennschaukel meas. 3=11822
- diffusion, into H₂, He, through porous materials, separation 3=9491
- diffusion of Kr⁸⁵ in dense gas 3=1720
- diffusion of Kr⁸⁶, meas. 3=3822
- diffusion in Rb halides, after n irradi. 3=15508
- discharge, excitation of Hg, Xe, by collisions 3=19190
- electron momentum-transfer collision frequ. in He mixtures 3=24220
- fast Kr⁸⁰, ⁸², ⁸⁴, ⁸⁶ colls with inert-gas atoms; slow-ion production 3=366
- gas, acoustic isotherms 3=16659
- gas, ionization by H atoms and protons 3=5620
- gas, ionized, rarefied, charge-carrier diffusion 3=16906
- gas, thermal self-diffusion 3=11817
- glow, admixture rel. to Ne reference tube 3=4054
- ion beam, range in metals from sputtering yield 3=5721
- ion beams, multiply-charged, in isotope separator 3=14669
- ion emission, field 3=19371
- ionization by h.f. pulse, recombination 3=4024
- ionization potential by photoelectron energy spectra 3=7434
- ions, range in WO₃, 40 keV 3=22878
- isotope separation, in 90° sector e.m. separator 3=12787
- light source lamps, spectra, 230-1200 mμ, effect of structure and excitation 3=16760
- liquid mixture with methane, viscosity 3=7185
- liquid, neg. ion mobility in 3=1678
- liquid, viscosity and mol. interaction 3=9423
- luminescence, α-ray excited, weak, 2400-5000 Å 3=21447
- luminescence, X-ray excited, increase due to electric field, pulsed 3=16664
- plasma in anode-glow mode, neg. resistance 3=5635
- plasma, cold, negative radiation temperature 3=9787
- plasma, effects of magnetic fields, locally applied 3=12116
- plasma, shock produced, coupling of micro-waves 3=16943-4
- saturated vapour pressure difference for Kr^{82,86} 3=21633
- solid, u.v. absorpt. and electron states 3=2998
- spectrum, Stark effect and Kr₂, Kr₂⁺ obs. 3=4751
- thermal ionization, kinetics 3=14515
- viscosity, 297-666°K 3=9494
- X-ray spectra, L-absorption 3=8189
- Kr⁸⁶ ions, range in Al, W, 3-600 keV 3=14675
- Kr⁺ sputtering of Cu, Ni, Fe, Mo, 100-1000 eV 3=4216
- KrII excitation by H⁺ and He⁺ 3=12770
- Kr II line broadening in plasma 3=10454
- Kr-Ar, liquefied mixtures, kinematic fluidities 3=1673

Laboratories

- See also Acoustical laboratories.
- Rutherford, two particle accelerators, use by universities 3=24393
- seismology, Edinburgh research group 3=9002
- Laboratory apparatus and technique**
- acoustic drying, in standing sound wave. 3=218
- airborne dust sampler, drum-pump 3=8982
- alignment of heavy instruments using Teflon steel 3=9393
- atomizer, vibrating capillary, construction and operation 3=13981
- bonds, between sheet materials, testing, use of heat conduction 3=13984
- capillary cores of undrawn nylon filaments 3=21180
- chemical polish for Pb telluride 3=6881
- closure of metal tubes by hot forging 3=13982
- crucible material, use of vitreous C 3=21181
- curve plotting with pulse-height analyser 3=9392
- dilatometer, silica, for wide range of temps. 3=7163
- electrolytic cutting, shaping of metal specimens 3=11649
- evaporation method without irradiating object to be coated 3=21178
- fine movement control, BaTiO₃ ceramics 3=7418
- handling of sealed glass bulbs with gas at 280 lb/in² 3=11648
- hole drilling with ion beams 3=3695
- hole formation, near atomic dimensions, silicate materials 3=16468
- i.r. container for test pieces 3=11999
- liquid level controller 3=11645
- metal disk, thin, lapping vacuum 3=23721
- metal single crystals, machining and cutting 3=8814
- 1963 Institute of Physics and Phys. Soc. Craftmanship Competition 3=9314
- 1963 Institute of Physics and Phys. Soc. Exhibition 3=9313
- nuclear spot-welding 3=13977
- particle separation with zonal ultracentrifuge 3=7077
- pneumatic annular atomizers for flame photometers 3=21549
- rapid handling system, irradi. soln. 3=24885
- replication process, carbon evaporation on metal film 3=13547
- rubber objects, simple prod. technique 3=13980
- single crystal, thin section prep. by ultramicrotome 3=13978
- slow displacement device 3=5309
- thinning of metals for electron microscopy, jet technique 3=11333
- time-scale generator, logarithmic 3=9405
- photoelastic model for joined structures 3=5396
- time switch for corridor demonstration 3=7083
- water rig, transparent models for flow study 3=7190
- welding W, Ta, Nb 3=18685
- ultramicrotome UMT-2, performance 3=3696
- track follower, oscillogram 3=19529
- GaP, n-type, thermocompression bonding of contacts 3=23722
- Ge, electropolishing 3=23501
- Nb, welding 3=18685
- NH₄ alum, reagent grade, purification 3=1265
- Si, electropolishing 3=23501
- Ta, welding 3=18685
- Te, high-purity, prod. and analysis 3=18684
- W, welding 3=18685

Lanthanum

La²⁺, in CaF₂, e.s.r. 3=20650

Lanthanum compounds

- ethylsulphate, with Pu³⁺, absorption spectrum 3=8601
- ferrite, ortho, effect of substituting Al³⁺ for Fe³⁺, from mag. meas. 3=8683
- intermetallic or alloy, ultra-high field supercond. 3=3964
- lanthanide salts, audiofrequency dispersion effects 3=23243
- trichloride, with Pu³⁺, absorption spectrum 3=8601
- (Ce, La)₂Mg₃(NO₃)₁₁·24H₂O, protons, polariz., 170 times increase in 3700 Oe at 1.6°K 3=20065
- La ethyl sulphate, e.s.r. of Cm³⁺ 3=13299
- La tungstate, red luminescence under u.v. excitation 3=13206
- LaAlO₃, Ga³⁺ e.s.r. and phase transform. 3=11112

Lanthanum compounds — contd

- LaB₆, n.m.r. and quadrupole binding const. 3=20678
- LaB₆, optical constants and energy spectra 3=20437
- LaB₆, semiconducting, from reflectivity and absorpt., 15.5 μ 3=20437
- LaC₂ neutron diffract. & paramag. scatt. analyses 3=1328
- La₂C₃, neutron diffract. and paramag. scatt. analyses 3=1328
- LaCl₃, e.s.r. of Cm³⁺ 3=13299
- LaCl₃:Pr³⁺, fluorescence due to X-rays 3=953
- LaCo nitrate, thermal conductivity, rel. to spin-phonon interactions 3=8375
- La₃Co₂(NO₃)₁₂·24H₂O, mag. susceptibility and crystal structure 3=8867
- La₂Co(NO₃)₁₂·24H₂O, phonon scatt. and thermal resistivity, low temps. 3=15427
- LaCrO₃, antiferromag. props. 3=3147
- LaCu₂, crystal structure, atomic, as AlB₂ 3=20874
- LaF₃, growth of highly-perfect single crystals for masers 3=23397
- LaF₃:Er³⁺, absorption and fluorescence spectra, 3500-10 000 Å 3=25457
- LaF₃, Nd³⁺ doped, optical absorption 3=20481
- LaF₃:Pr, absorption and fluorescence spectra, Pr bond covalence 3=23072
- (1-x)LaFeO₃ — xSr(Ni_{0.8}W_{0.2})O₃, ferromag. props. 3=5025
- La₂Ge₃, crystal structure 3=8842
- La-H system, La and H n.m.r. meas. 3=20671
- LaI₃, molten, elec. cond. of La 3=21404
- LaMg nitrate, Ce³⁺, Nd³⁺, Pr³⁺ spin-lattice relaxation time, rel. to echo formation 3=1195
- La-NiO₄, antiferromagnetism 3=18107
- La₂O₃, cathodoluminescence, activated by rare earths 3=13214
- La₂O₃, specific heat and thermodyn. props. 3=20104
- La₂Zn₃(NO₃)₁₂·24H₂O, Co ion relax. 3=8723

Lasers

See Masers, optical.

Latent heat

See also Heat of adsorption, etc; Thermodynamic properties.

vaporization, reliable, Haggmacher method 3=16840

Lattice dynamics

See Crystals, lattice mechanics.

Lawrencium

No entries this year

Lead

- atom, μ-mesonic, X-ray transition energies 3=6370
- atoms, L-shell fluorescence meas. 3=4711
- conduction electrons, data from optical and elec. meas. 3=22677
- in contact with Bi, melting 3=15525
- creep, pressure depend. 3=23333
- creep, t^{1/3} law 3=6794
- crystal growth, large single, for neutron monochromatization 3=23403
- cyclotron resonance, at 36 kMc/s 3=6505
- de Haas-van Alphen effect, 35 kG 3=20559
- deformation, microstresses, X-ray analysis 3=20704
- density, bulk and X-ray 3=25731
- diffusion, anomalous, of Ce, Nd and Pm 3=13005
- diffusion in Au crystals in boiling HCl 3=4888
- elastic moduli at low temp., rel. to Debye temp. 3=1212
- elastic resonance peaks, rel. to dislocation motion 3=1220
- elec. resistance, 4.2°-1.65°K, rel. to sample size 3=2851
- elec. resistance, rel. to impurity 3=25324
- elec. resistance, 10°-14°K 3=2852
- Fermi surf. invest. by cyclotron res. 3=6494
- Fermi surface "necks", magnetoresist. meas. 3=25243
- film on Ag, Pd, Ni, structure 3=1371
- films, conductance during vacuum deposition 3=25327
- films, supercond., vapour sources for vacuum deposition 3=9525
- films superconductivity and normal cond. rel. to adsorbed O 3=16872
- films, superconductivity, rel. to residual gases 3=16878
- foils, X-irrad., 320 kV, secondary electrons 3=12241
- impurity ions in Pb, scattering cross-sections and charges 3=17813

Lead — contd

- internal friction, effects of temp. (room-200°C) and number of elastic-plastic cycles 3=6778
 ions, diffusion in KCl crystal 3=15510
 lattice dynamics, dispersion curves at 100°K 3=2708
 lattice vacancy equilibrium concentration 3=22739
 lattice vibrations, Fermi surface image 3=6467
 liquid, Hall effect 3=16636
 liquid, Hall effect, meas. 3=7218
 magnetoacoustic effects, h.f., and Fermi surface meas. 3=6472
 magnetoacoustic effects in longitud. fields 3=25192
 magnetoplasma resonance, l.f., meas. 3=8409
 n.m.r., broadening in fine particles 3=20681
 neutron scatt., cold, by solid and liq. 3=4823
 overstressed microregions, mech. props. 3=11142
 phonon spectra, Kohn anomalies 3=25190
 polycrystalline, flow behaviour under simple shear 3=6793
 polymorphism at high pressure 3=8883
 porous, dynamic compression 3=6787
 shock compression up to 9×10^6 atm 3=6786
 specific heat, 0.3°-4°K 3=10601
 spin-spin coupling with protons 3=719
 sputtering by Ar^+ , 1.2 MeV, preferential ejection 3=7656
 stacking faults, bulk specimens, measurement probabilities 3=12992
 supercond., crit. field, effect of neutron irradiation, at 78°K 3=14451
 superconducting 3=328
 superconducting, energy-gap functions, theory 3=16867
 superconducting energy gaps, by electron tunnelling 3=333
 superconducting hollow cylinder, frozen-in mag. flux 3=12022
 superconducting, injected electron lifetime 3=14450
 superconducting, mag. field noise, Barkhausen type 3=24147
 superconducting, as permanent magnet 3=338
 superconducting ring, trapped-flux decay, rel. to irrad. 3=3955
 superconducting, surface electrical losses, in l.f. fields 3=12033
 superconducting tunneling current, calc. 3=18858
 superconductive thermal boundary resistance, with Cu 3=19108
 superconductivity, crit. fields, effect of cold working at 78°K 3=5588
 temp. change at boundary with superfluid He 3=5570
 ultrasonic attenuation 3=4819
 zone refining 3=23487
 in Bi, effect on phase transformations 3=25751

Lead compounds

- alloys lattice vacancy equilibrium concentration 3=22739
 magnetoplumbite, electron mirror micrographs, stray field meas. 3=13266
 perovskite, coexistence of ferroelectric and ferrimagnetic states 3=6614
 superconducting, critical current/mag. field, imperfection effects, alloy 3=19112
 superconductivity 3=24148
 telluride, chemical polishing 3=6881
 Pb azide bars, dislocation vels. 3=22778
 Pb base cast alloys, elec. resist. rel. to composition 3=20262
 Pb-base solid solutions, superconductivity 3=14449
 Pb-base supercond. alloys, mag. props. 3=9684
 Pb halides, adsorption of water vapour 3=1381
 Pb halides, exciton spectra, low-temp. 3=10934
 Pb silicate glasses, elec. cond. rel. to "water" content 3=2945
 Pb solutions, surface tension, temp. depend. 3=21340
 Pb-Al₂O₃-Pb structures, Schottky electron field emission 3=9828
 Pb(99%)-Bi alloy, electronic spec. ht. 3=6478
 Pb-Bi, supercond., a.c. loss 3=3956
 PbBi₄Te₇, crystal structure 3=6838
 PbBi₄Te₇, second superlattice structure 3=13508
 PbBi₄Te₇, structure, by electron diffr. 3=13510
 PbBr₂, activity coeffs., in reciprocal molten salt systems
 PbBr₂ + NaCl and PbCl₂ + NaBr 3=18155
 PbBr₂, fused, thermoelectric power 3=9477

Lead compounds — contd

- Pb-Cd, pptn. and superconductivity 3=24145
 PbCl₂, aerosols, phase changes 3=1402
 PbCl₂, fused, thermoelectric power 3=9477
 PbCl₂, fused, refractive index rel. to temperature 3=11796
 PbCl₂-KCl melt, double layer, capacity 3=3400
 PbCl₂, TiCl₄ or BiCl₃-doped, electrolytic cond. 3=17926
 PbF₂, aerosols, phase changes 3=1402
 PbF₂, exciton band at 2190 Å 3=24050
 Pb(Fe_{1/2}Nb_{1/2})O₃ ferroelec.-antiferromag. props. 3=6615
 Pb(Fe_{2/3}W_{1/3})O₃ ferroelec.-antiferromag. props. 3=6615
 PbI₃ aerosols, ice-forming props., cloud seeding 3=8987
 PbI₃, elec. cond. rel. to photodecomposition 3=2921
 PbI₂, exciton spectra at 4.2°K 3=2765
 PbI₄, fission fragment damage 3=20253
 PbI₃, fission-fragment tracks 3=25306
 PbI₂, luminescence, rel. to absorption 3=6669
 PbI₂, photoconduction, extinction effect 3=17960
 Pb-In, density and phase diagram 3=25731
 Pb₂MgWO₆, antiferroelectric polymorphic transition point rel. to press. 3=17945
 Pb₂MgWO₆, crystal structure 2=23459
 Pb₂MgWO₆-PbTiO₃ solid solutions, crystal structure 3=23459
 PbMoO₄, absorption and luminescence 3=20479
 Pb(NO₃)₂, elastic and thermoelastic props. 3=18161
 PbO, activation energy, rel. to temp. 3=17978
 PbO, Bordoni peaks 3=23294
 PbO, with cation impurities, conductivity, disorder phenomena and colour 3=13075-6
 PbO crystals, photoconductivity 3=6635
 PbO films, prod. and light refl. 3=8927
 PbO, photoconductivity surfaces, in n-PbS-p-PbO films, in Resistron charge-storage tubes 3=25419
 PbO, self-diffusion of O, oxidation process 3=20230
 PbO-B₂O₃ glasses, structure, by n.m.r. 3=18148
 PbO-TiO₂-ZrO₂ system 3=3255
 PbO, PbTe, i.r. band system 3=22543
 Pb(98%)-Tl(1%)-Bi alloy, electronic spec. ht. 3=6478
 PbO₂, sputtered films, elec. props. 3=2919
 PbO₂, tetragonal, oxygen parameter 3=1329
 PbS, adsorbed monolayers 3=1379
 PbS, charge carrier properties 3=6598
 PbS, conductivity, electrical, pressure depend., up to 9000 kg cm⁻² 3=22948
 PbS, crystal growth, from melt, 100-200 atm. of N₂ 3=18244
 PbS decoration of mica 3=16050
 PbS, diffusion of Ni⁶³ 3=17785
 PbS, dislocations rel. to nonstoichiometry 3=25266
 PbS, effect of Cu on elec. and carrier props. 3=15593
 PbS, elec. conductivity, rel. to pressure 3=10833
 PbS, electrical props. rel. to elastic strain 3=10832
 PbS, film, current-induced photo-e.m.f. 3=17961
 PbS film, epitaxial, magneto-optical absorpt. lines 3=17984
 PbS films, evap., dislocation types 3=17754
 PbS, growth of single crystals by Bridgman-Stockbarger method 3=18262
 PbS, layer formation on glass and mica 3=13564
 PbS layers, photovoltaic effects 3=25417
 PbS, magnetoplasma reflection with polarized light 3=10822
 PbS, molecules, rotational analysis of absorption spectrum 3=10511
 PbS, n- and p-type, magnetoresistance and band structure 3=868
 PbS, photoelec. props. and carrier parameters 3=2977
 PbS photovoltaic layers, structure, e.m.f. 3=3356
 PbS, piezoresistance anisotropy, 3=6599
 PbS, refr. index dispersion near absorpt. edge 3=25436
 PbS, self-diffusion of Pb²¹⁰ 3=10688
 PbS stress-sensitivity, methods of obtaining 3=18176
 PbS, surface potential, changes on illumination 3=20414
 PbS, thermoelectricity, pressure depend. up to 9000 kg cm⁻² 3=22948
 PbS, vacuum u.v. photoelec. emission 3=8596

Lead compounds—contd

- PbS, velocity, acoustic waves, u.s., 80-640°K, along [100] and [011] 3=20090
- PbS, S X-ray spectrum, emission, $L_{2,3}$ 3=23096
- PbS:Ti₂S, photocond. spectral response of films 3=23018
- PbSO₄, crystallization, effect of additives 3=23402
- Pb(Sc_{0.8}Nb_{0.2})₂Φ₁₋₄O₃, ferroelec. props 3=6616
- PbSe, donor imperfections rel. to hybrid Frenkel-type disorders 3=2788
- PbSe, elec. conductivity, rel. to pressure 3=10833
- PbSe, electrical props. rel. to elastic strain 3=10832
- PbSe, electron band structure, rel. to piezoresistance 3=15594
- PbSe, electron energy band structure, rel. to piezoresistance 3=15592
- PbSe layers, sensitive to 4.8μ 3=15633
- PbSe, n- and p-type, magnetoresistance and band structr. 3=868
- PbSe, refr. index and effective electron mass 3=10904
- PbSe, semiconducting, p-type, forbidden-band width 3=17889
- PbSe, thermal resistance, rise nr. Debye temp. 3=17670
- PbSe, in thermoelec. elements, efficiency 3=2985
- PbSe-Bi₂Se₃ system, phase diagram, elec., thermal and mech. props. 3=25742
- PbSe-Sb₂Se₃ system, phase diagram, electrical, thermal and mechanical props. 3=25741
- Pb-Sn, pptn. and superconductivity 3=24145
- Pb-Sn supercond. mag. field detector 3=468
- PbTe, Azbel-Kaner cyclotron resonance 3=17698
- PbTe, band structure and transport properties 3=10830
- PbTe, cold worked and annealed, X-ray diffr. study 3=18203
- PbTe, conductivity, electrical, pressure depend., up to 9000 kg cm⁻² 3=22948
- PbTe, donor imperfections rel. to hybrid Frenkel-type disorders 3=2788
- PbTe, elastic constants 3=8751
- PbTe, elec. conductivity, rel. to pressure 3=10833
- PbTe, elec. resistivity and Hall coeff. 3=867
- PbTe, electrical props. rel. to elastic strain 3=10832
- PbTe, electron band structure, rel. to piezoresistance 3=15594
- PbTe, electron energy band structure, rel. to piezoresistance 3=15592
- PbTe, Hall coeff. and elec. cond., 4.2° to 295°K 3=10829
- PbTe, i.r. transmission and reflection, 28°-296°K rel. to carrier concentration 3=10907
- PbTe, Landau level studies; Azbel-Kaner cyclotron resonance 3=10831
- PbTe, low freq. dielec. const. 3=13106
- PbTe, magnetoresistance p-type, 4.2°K, oscills., with increasing mag. field 3=15595
- PbTe, n- and p-type, magnetoresistance and band structr. 3=868
- PbTe, p-type, Azbel-Kaner cyclotron resonance 3=784
- PbTe, phase diagram, temp.-press. projection 3=13512
- PbTe, refr. index and effective electron mass 3=10904
- PbTe, semiconducting, oscillations, plasma, helicon 3=13079
- PbTe, thermoelectricity, pressure depend., up to 9000 kg cm⁻² 3=22948
- PbTiO₃-BaZrO₃, structure and elec. props. 3=13481
- PbTiO₃-BiFeO₃, Curie point behaviour 3=13116
- PbTiO₃-LaAlO₃ solid solutions, phase diagram 3=20767
- PbTiO₃-LaFeO₃ system, X-ray diffr. and elec. props. 3=20852
- Pb(Ti,Zr)O₃, thermal expansion and pyroelectricity 3=12929
- Pb₂TiP₂O₈, luminesc. and crystal structure 3=10982
- PbTlxZr_{1-x}O₃, p-type elec. conductivity 3=25400
- Pb-Tl crystals, supercond., quasi-reversible mag. behaviour 3=3957
- Pb₂ZrAs₂O₈, luminesc. and crystal structure 3=10982
- PbZrO₃, antiferroelec. phase, absorpt. band 3=2956
- PbZrO₃, dipole structure and internal elec. fields 3=22997
- PbZrO₃, ferroelec. props. 3=13118
- Pb₂ZrP₂O₈, luminesc. and crystal structure 3=10982
- Pb(Zr_{0.85}Ti_{0.15})O₃ with 1 wt.% Nb₂O₅, ferroelectric trans-formation, FE₁-FE₂ 3=22998

Lead compounds—contd

- PbZr_{0.85}Ti_{0.15}O₃, velocity acoustic and phase transform., Fe₁-Fe₂ 3=15618

Leak detection

- hermetically sealed containers, using Kr⁸⁶ 3=5310
- long time constants 3=21453
- sealed enclosures, small, non-destructive control. 3=184
- by H₂ adsorption, Pirani detection 3=14228

Leather

See Materials.

Length measurement

- See also Altimeters; Curvature measurement; Micro-metry; Strain gauges; Thickness measurement.
- amplitude of oscillating system, interference methods 3=23957
- calibration of linear scales 3=9390
- catetometer with automatic levelling 3=7165
- changes, by convex lens and glass plate 3=16569
- dilatometer, automatic recording 3=9639
- dilatometer, differential, automatic recording 3=21277
- fibres, profile measurement 3=11647
- height of water-wave 3=14084
- interference methods, spectral line narrowing methods, review 3=24037
- international standard, merits 3=13987
- laser, frequency-stabilized 3=22022
- level gauge in container, continuous-operation 3=3779
- line standards, interference comparators 3=13988
- liquid level, by container resonance 3=16568
- liquid level, stethoscope sensing 3=16567
- metre unit, history and definition 3=9316
- microscopy, visual factors 3=23719
- new standards 3=9315
- in nuclear track emulsions 3=19328
- range finder systems, performance prediction 3=18773
- SOFAR studies in South Atlantic 3=11386
- by He-Ne optical maser 3=19496

Length standards

See Standards.

Lenses

See also Electron lenses.

- aberration coeffs., normalized Buchdahl's, of 5th order 3=238
- aberration theories for semiautomatic design 3=14311-12
- aberrations, longitud., meas. in extra-axial region 3=237
- acoustic, solid, amplification factor 3=14270
- acoustic, spherical aberration, focusing 3=9561
- aplanatic, design 3=14314
- automatic design on large computers 3=16731
- automatic design, rel. to aberr. theory 3=16733
- centring, mounting error effect 3=11885
- Cooke triplet, automatic predesign 3=16735
- definition, "microcontrast" concept 3=11955
- dielectric rod focuser 3=18967
- doublet, cemented, principal point, object side 3=18982
- eyepiece, micrometer, coincidence split image 3=18971
- flare, meas. data analysis 3=16801
- focal length, equivalent, meas. using biprism 3=3866
- i.r., in contact with detectors, gain calc. 3=16736
- objective for 3-prism stellar spectrograph 3=11884
- phase retrieval in squaring operation 3=7311
- Ramsden eyepiece, colour correct, calc. 3=18964
- refractive index meas. 3=236
- single refl. surface, basic parameters calc. 3=7306
- spectacle, astigmatism and coma 3=11886
- superachromatic, design 3=14309
- superchromatic, design 3=16737
- telescopes, anamorphic, thin lens design 3=21529
- transfer function, from lens-design data 3=11888
- transfer function, measurement 3=11889
- u.v., doublets and triplets 3=16741

aspherical

No entries this year

Lenses**photographic**

- definition, "microcontrast" concept 3=11955
- distortion, radial, objective, meas., Moire fringe 3=21580
- fine-correction, with two-term spherical aberr. 3=7363

Lenses — contd

photographic — contd

- frequency response function, direct meas. 3=7362
- objectives, ultra-rapid, limitations 3=16814
- optical transfer function, image evaluation 3=16732
- for photocopying, tandem principle appl. 3=11958
- transfer function and aperture, rel. to emulsion function 3=21575
- transfer functions meas. by polarizing shearing interferometer 3=24047
- transfer function modulus, meas., test bench 3=14385
- triplet, objective, aberration, design control 3=24069

Leptons

- See also Electrons; Mesons; Neutrinos and anti-neutrinos.
- complex space and quaternion theory 3=17178
- conservation, single 4-component neutrino theory 3=7823
- conservations laws, existence of 2 neutrinos 3=12439
- creation in stars and novae 3=11500
- and currents, classification 3=17179
- decays, and unitary symmetry 3=22062
- e.m. properties, effects of weak interact. 3=24600
- experimental, review 3=4358
- hyperons, decay, and unitary symmetry 3=15035
- irreducible internal variables, quadruplet scheme 3=7775
- in isospace \mathcal{H} (R^3) 3=24599
- in isospace, strangeness, isotopic spin 3=2190
- isospin and higher groups 3=14877
- lepton currents, classification 3=14876
- leptonic decay of hadrons 3=24611
- leptonic decays in finite space 3=24601
- leptonic space with additive muonic no. 3=5926
- mass, with anomalous mag. moment 3=542
- " μ " in elementary particle classification 3=2226
- from ν absorpt. in Coulomb field of nuclei 3=10086
- strangeness zero assignment 3=545
- symmetry scheme, (μ^+ , ν , e^-) as fundamental vector 3=7769
- theory as alternative fermion state to baryons 3=22061
- theory, review 3=4359
- in unified classification of fundamental particles 3=24591

Light

See also Diffraction; Interference, etc.; Doppler effect; Radiation.

- amplification using laser beams, theory 3=7301
- coherence, quantum theory 3=16725
- coherency matrix for arb. bandwidth, theory 3=5507
- difference freq. obs., laser and lamp, in KDP crystal 3=18955
- emission by atoms, modulation in double reson. expt. 3=10471
- FM to AM conversion using birefringent crystals 3=9628
- frequency shifting, in crystal, by Pockels effect 3=5536
- generalized "cross-correl." field quantities 3=21203
- harmonic generation, in KH_2PO_4 , by laser, mode effects 3=23995
- harmonic generation, second, in solids 3=25430
- harmonic prod. on reflection from piezoelectric crystals, obs., GaAs, Te 3=18956
- information capacity 3=11909
- intensity fluctuations in partly polarized light 3=23994
- internat. standard, reproducibility 3=3701
- modulation and direct demodulation at microwave freqn. 3=5535
- modulation, in double resonance expt. 3=22474
- modulator, photoelastic 3=16747
- modulation, photomultiplier detect., 56 AVP 3=21509
- non-linear interactions, from masers, optical, review 3=17093
- optical power limiter, using nonlinear materials 3=14331
- partial coherence, polychromatic light 3=21573-4
- photomixing expts. using ruby laser 3=7320
- photon statistics of arbitrary field, full quantum theory 3=23992
- propagation from moving source, direct expt. 3=21513
- pulsating universe, behaviour of light 3=13853
- quantum and statistical aspects, teaching of 3=11877
- rectification, in crystals, with sufficiently low symmetry 3=5537
- relativistic deviation at solar limb. meas. 3=3731

Light — contd

- single-path band factors from double-path meas. 3=14338
- transient coherence 3=3861
- vortex sponge theory (1736), derivation of Maxwell's eqns. 3=24430
- wavelength meas., quantum limit 3=14304

electromagnetic theory

- diffraction, Kirchhoff—Young 3=19445
- in gyroelectric media, plane-wave propag. 3=3896
- in gyroelectric media, reflection 3=11925
- Maxwell's eqns., as props. of the vortex sponge 3=24430
- nonlinear media, waves at boundary, soln. of Maxwell's eqns. 3=231
- optical harmonics and nonlinear phenomena 3=21505
- self-excitation of metal coated, plane-parallel crystalline layer 3=23031
- in vacuum, non-linear interaction 3=9573

quantum theory.

See Photons; Quantum electrodynamics; Quantum theory.

velocity.

See Velocity, light.

Light sources

See also Monochromators; Photographic light sources;

- Photometry, light sources; Spectroscopy, light sources.
- automatic adjustment of excitation voltage 3=1806
- colour rendering, meas. and specification 3=24003
- colour rendering, tolerance bands 3=24002
- colour temperature measurement by spectral line relative intensities 3=9587
- cylindrical, emission distrib., calc. from intensity profile 3=11903
- "effective source" concept and partial coherence 3=21530
- exploding wires, for optical-maser excitation 3=9588
- far infrared, by beating two masers 3=14334
- flash discharge, highly condensed, time-resolution study 3=9591
- flash photolysis lamps, triggering by ignitrons 3=16759
- flashes, high intensity, from spark discharges in air 3=21742
- flashes, using interrupted total internal refl. 3=24014
- flash-lamps, double-pulsed, enhanced u.v. output 3=24013
- ideal thermal source, semiconductor covered with W 3=11904
- inhomogeneous, photoelec. scanning, Abel inversion. 3=14347
- luminescent, colour and efficiency 3=24005
- measurement, luminous flux, graphical and mechanical methods 3=18975
- meas., spectral distrib., by spectrophotometer, modified 3=18991
- modulation at 200 Mc/s in GaAs diode 3=5895
- nanosecond duration 3=18979
- nsec spark discharge, in capillary 3=11905
- for photomultipliers, hum cancellation 3=24177
- pulse generator, nsec 3=18977
- pulsed, spark gas discharges 3=14546
- for pyrometry, photoelectric, secondary, tungsten strip lamp suitability 3=9643
- radiance-coeff. profile, exptl. det. 3=24004
- rapid pulses 3=16758
- self-excitation of metal coated, plane-parallel crystalline layer 3=23031
- semiconductor thermal radiators, selective, possibility 3=23993
- spark. brightness temps., peak. 4500-3000 A 3=4053
- stroboscopic, for precision timing applications 3=18976
- thermal radiators, selective, semiconductor, possibility 3=23993
- tubular pulsed discharges, spectral charact. 3=18978
- tungsten filament, for secondary standard reproduction of candela 3=9317
- u.v., all-metal, arc, l.p. 3=21533
- u.v., low-pressure Hg arc, for calibr. 3=14329
- u.v. pulses, short intense, Kerr cell controlled 3=24015
- u.v., vacuum, duoplasmatron 3=5525
- Ar, lamps, spectra, 230-1200 m μ , effect of structure and excitation 3=16760
- Cs lamp for optical pumping 3=16761
- H lamp, for vac. u.v. photochem. use 3=14330

Light sources — contd

- Kr, lamps, spectra, 230-1200 m μ , effect of structure and excitation 3=16760
- Ne, gas discharge tube, line-source, ang. distrib. 3=16757
- Xe arc lamp, for Nd laser 3=22014
- Xe lamp, for ruby laser 3=18980
- Xe lamps, for optical pumping 3=21532
- Xe lamps, spectra, 230-1200 m μ , effect of structure and excitation 3=16760

Lighting

See Illumination.

Lightning

- and atmospheric whistlers 3=23599
- ball, and plasmoids 3=13686
- charges conducted in strokes, detm. 3=18515
- cloud-to-cloud discharges, atmospherics 3=9049
- continuing currents 3=23596
- continuum spectrum 3=16225
- correlation with musical atmospherics 3=13680
- counters, effect of triggering and filter circuits on sensitivity and ranges 3=16223
- currents, statistical analysis 3=16224
- data analysis, rel. to atmospherics 3=3470
- discharges correl. with waveforms of atmospherics 3=9047
- electric field change chars. 3=16222
- electric field changes, effect on counter circuits 3=16223
- excitation temperature 3=13685
- radiation field characteristics in 1-100 kc/s 3=23598
- and sparks, electric, negative, in air, 1-3 m 3=21738
- temperatures, from NII lines 3=11415
- in tropics 3=18516-17

Liquefaction, gases

See also Low-temperature production.

- He, cascade compression liquefier 3=5560
- Ne, Linde, 66°K, 50-200 atm. 3=21640
- Ne (73%)—He (27%), Linde, 66°K, 50-200 atm. 3=21640

Liquid crystals

- anisaldazine, dielec. const. 3=11803
- cholesterol esters, transparency 3=21370
- domains, in electric field, in nematic phase 3=23867
- nematic and cholesteric organic cpds., order and flow 3=9441-2
- p-azoxybenzoate, smectic, drop and rod growth 3=21313
- structure classification 3=128

Liquid helium

See Helium, liquid.

Liquid oscillations

- columns, viscous damping and turbulence limit 3=119
- rotating liquid, slow forcing region, travelling-wave disturbances 3=18792
- He, torsional, theory 3=19090

Liquid waves

See also Acoustic waves.

- Lee waves in stratified fluid, periodic, linear soln. 3=3792
- magnetohydrodynamics, in rotating liq. 3=9919
- viscous, in film and boundary plate 3=14124
- wakes, laminar, 2-dimens., stability at low Reynolds no. 3=11764

surface

See also Oceanography.

- deep-water, due to arbitrary periodic pressures 3=1424
- effect of viscosity and capillarity on water flow in canals 3=9431
- gravitational flexure waves under thin elastic layer 3=1422
- hydrons, particle concept for energy transfer 3=120
- inclined plane, layer, stability 3=11765
- sea, attenuation with depth 3=16199
- u.s. excitation 3=23850
- water, damping by monomol. films 3=5423

Liquids

See also Association, liquids; Diffusion in liquids; Solutions.

- adhesives, review of action 3=124
- associated liquids, dielec. and mechanical relaxation 3=21390
- compressibility, at high pressures 3=23311
- dielectric, ion drag pumping 3=11778-9
- dielectric properties, bibliographies 3=13102

Liquids — contd

- dipole orientation relaxation, from light scattering 3=7207
- drops, falling, elec. potl. acquired 3=7217
- drops in, movement of, due to surface-active substances 3=5426
- electrical birefringence, absolute retardation ratio detm. 3=11802
- elec. conduction, pressure analysis 3=9479
- electrolytes, cond. meas. bridge, 4 electrode 3=11353
- electrolytes, discharge features 3=9473
- electrolytes, as acoustic generators, in capillary systems containing Hg droplets, on appl. a.c. 3=18911
- electron motion, quantum mechanical treatment 3=10747
- expanding cylinder problem 3=107
- Faraday rot. meas., molten salts. up to 1100°C 3=7206
- Hall effect, Hg—In alloy 3=9476
- heat transfer in insulating liquids, and charge carriers 3=14148
- inclusion problem 3=790
- intramolecular oscillations, thermal relaxation 3=22609
- level control apparatus 3=11645
- level meas., by container resonance 3=16568
- metal—liquid heat transfer, Kapitza temp. jump, effect of cond. electrons 3=15454
- metals, electrical properties 3=143
- metals, thermoelectric power of 10 elements 3=145
- metals, transverse transport coeff., 0.1% Au amalgam 3=3814
- mist over surface, dynamic equilibrium 3=5556
- mixtures, binary, organic, Rayleigh consts., by light scattering 3=5442
- molecular reorientation, angular autocorrelation functions 3=16602
- molecular, N¹⁴ nuclear relaxation by quadrupole interactions 3=9482
- molecular liquids, vibration absorpt. bands, intensity, temp. depend. 3=21376
- n.m.r. expts. 3=25583
- neutron scattering, conference Chalk River (1962) 3=8326
- nuclear mag. resonance of O¹⁷ in various liquids 3=148
- nuclear spin relaxation 3=16638
- organic, H bond and dielec. props. 3=21385
- organic liquid pairs, coord. numbers and diffusion coeff., temp. depend. 3=21329
- positron lifetime, variation with pressure 3=10099
- proton magnetic resonance, in anisotropic liquids with axial symmetry 3=5452
- Rayleigh light scattering, molecular orientation distrib. 3=21369
- Rayleigh light scattering, theory 3=14166
- review, introduction to 1961 Kiev conference 3=21300
- scattering of sound, underwater, from liquid sphere 3=11794
- spreading on Zn, effect of surface texture, for Hg 3=5427
- surface active, effect on solid, surface energy 3=6879
- surface shape under diminishing gravity 3=9288
- thermal diffusion, inertial effect, theory 3=16608
- thermal properties, anomalous, near f.p. 3=21324
- u.s. absorption, pulse apparatus and data 3=230
- velo., acoustic waves, mixtures, organic, var. 3=16622
- CsNO₃, fused, transport number of Cs⁺ ion 3=3796
- Hg, electron states, positron annihil. data 3=12954
- H₂O—CO₂ system, in turbulent motion, mass transfer, conc effect 3=16152
- Nd, surface tension, by bubble pressure, 1030—1186°C
- Te, elec. cond. and Hall effect up to 850°C 3=9474

structure

- n-alcohols, orientational relax. times, from Rayleigh line-width 3=21366
- aliphatic, electron diffraction examination 3=21305
- alkyl bromides, orientational relax. times, from Rayleigh line-width 3=21366
- alloys, autoradiography investigations 3=3318
- aromatics, with methoxy groups, dielec. data 3=21389
- cell for X-ray diffraction studies 3=7669
- during evaporation, viscous flow mechanisms 3=21320
- for glass formation 3=9443
- H-bonded, by neutron scattering 3=5428
- heavy water, slow neutron scattering 3=9445-6
- meth.ne, slow neutron scatt. analysis 3=14142
- metals, electronic structure, "wave vector" model 3=23901

Liquids—contd

structure—contd

- metals, post-melting interatomic binding relations 3=3926
- molecular orientation distribution, from Rayleigh light scatt. 3=21369
- molecular reorientation, anisotropy and dipole relaxation times 3=21302
- monatomic liquids, X-ray intensity analysis 3=21304
- nematic and cholesteric organic cpds. 3=9441-2
- neutron scattering studies, Chalk River (Sept. 1962) symposium 3=6456
- organic liquid crystals, domain structure, rel. to ultrasonics 3=18798
- organic, viscosity data 3=21312
- paraffins, normal, optical anisotropy, from Rayleigh scatt. 3=136
- n-paraffins, orientational relax. times, from Rayleigh line-width 3=21366
- polysiloxanes, linear, u.s. relaxation study at 30-270 Mc/s 3=11793
- quasispherical molecules, rotary mobility 3=21301
- semiconductors, melted, association 3=21614
- silicate glasses, fused, from diffusion measurements 3=1362
- spheres, binary mixtures, random loose packing 3=11781
- surface layer, rel. to surface and bulk props. 3=16600
- water, at room-temperature 3=9444
- water, by neutron diffusion, 0, 20°C 3=6017
- water, cavity radius, from refractive index 3=23899
- water, "free volume" and viscosity 3=11780
- X-ray diffractometer 3=14704
- X-ray study, survey and bibliography 3=21303
- Ag, by separating X-ray scatt. pattern contribs. 3=9438
- Al, local crystal. order and band system 3=16628
- Au, by separating X-ray scatt. pattern contribs. 3=9438
- Bi, by electron diffr. 3=16123
- Bi, ultrasonic study 3=9457
- Ga, near m.p., by positron annihilation 3=21306
- Gd³⁺ perchlorate solutions, hydration, from n.m.r. 3=18832
- Hg, by separating X-ray scatt. pattern contribs. 3=9438
- Hg, ultrasonic study 3=9457
- Hg, X-ray scatt. study, temp. depend. 3=7198
- (H₂O)₄ cubic complex in water 3=23868
- H₂O, surface 3=21307
- H₂O, slow neutron scatt. 3=14141
- In, superheated, electron diffr. study 3=9440
- In—Pb alloys, short-range order 3=21308
- In—Sn alloys, short-range order 3=21308
- NH₃, mol. rotation hindrance, by neutron scatt. 3=14140
- Na, f-sum rule, violation, by slow neutron scattering 3=5429
- Na borate glass 3=1361
- Sn, supercooled and superheated 3=9440
- Sn, X-ray diffr. determination 3=7197

theory

- See also Dielectric phenomena; Equations of state, liquids.
- alloys, dilute, interaction parameters 3=16603
- binary metal solns., free surface energy, statistical electron theory 3=23485
- cell-cluster theory, Monte Carlo calc. 3=5416
- classical 3=5417
- compressibility, repulsion law, polar liquids 3=3795
- condensation, critical point and metastable state 3=21634
- dipole coupling in polar liquids 3=18826
- disordered 1-dimensional systems, electronic states 3=22673
- electro-optical effects, in critical region 3=21371
- electrolyte solutions, spin-lattice relaxation, theory 3=149
- electron in "one-dim." chain, weak-binding approx. 3=9325
- excitons, localized, hydrodynamics 3=21403
- extended hole theory, partition function calc. 3=11782
- fermion liquids 3=77
- free volume theory, ind. correl. theory 3=1676
- hole theory, internal entropy, energy, and ht. capacity 3=18800
- Kerr effect in multicomponent systems 3=7249
- lattice vacancy theory, in gas adsorption 3=3363
- magnetic relax., molecular shape effect 3=21405

Liquids—contd

theory—contd

- metals, cold neutron scattering, theory 3=4823
- metals, electron correl. effect on elec. resistivity 3=23903
- metals, electronic transport and states, review 3=21401
- molecular distribution functions, variational theory and superpositional approx. 3=21315
- molecular force correl., rel. to collective motion 3=129
- molecular reorientation, distrib. functions and friction consts. 3=16601
- molecular rotation, n.m.r. study 3=14143
- molecular vibrations, energy dissipation processes 3=3794
- neutrons, cold, quasi-scattering 3=18797
- nonelectrolyte solutions, averaged Boltzmann-factor 3=16613
- n.m.r. for molecules with four spin- $\frac{1}{2}$ nuclei, calc. 3=147
- n.m. relax., by spin-rotational interact. 3=18833
- nuclear mag. relax., longitud. and transverse components 3=23914
- Percus-Yevick integral eqn., soln. 3=14138
- polar, interactions in 3=23894
- pressure, internal, rel. to u.s. velocity 3=21358
- radial distrib. functions for long-range forces 3=14137
- relaxation properties, linear dipole chain model 3=21387
- Smoluchowski eqn., improved correction 3=21317
- statistical model, with molecular interaction 3=21314
- solutions, aqueous, electron transfer between ions, Fe²⁺—Fe³⁺ theory 3=14178
- thermal agitation waves and energy transfer 3=3805
- u.s. atomization of liquid films 3=23850
- with radical, spin-lattice relaxation 3=3817
- wave perturbed oscillator theory 3=14136
- CCl₄, mean potl. curve, friction const. 3=21316
- H₂, approximate cell model 3=11783
- H₂, cell model, Lennard-Jones—Devonshire, thermodynamic props., six isotopes 3=21318

Lithium

- atom, 2P state, optical resonance fluorescence, "anticrossings" 3=17526
- atom, calc. by adiabatic approx. 3=8187
- atom, correl. of electrons in same shell 3=8175
- atom, dipole transition probabilities, approx. calc. 3=19937
- atoms, electron scatt., 1-10 eV, total cross-section 3=2582
- atom, ground state, variation calc. 3=15284
- atom, hyperfine interaction, effect of correl. 3=10455
- atom, hyperfine splitting of ground state 3=10457
- atoms, photoelectric K-absorption cross-section 3=704
- atoms, photoionization cross-section, 2300-1450 Å 3=4016
- atoms, scatt. by Xe, velocity depend. of cross-section 3=711
- atom, specific isotope shift calc. 3=10456
- band structure, composite wave variational method 3=25237
- compressibility calc., rel. to exchange charge volume 3=23282
- diamagnetic suscept. theory, weak-binding approx. 3=25500
- diamagnetism, s—p band model 3=8638
- elec. resist., effect of pressure at low temps. 3=828
- electrical resistance, pressure effects 3=22895
- electrolytic enrichment of isotopes 3=13617
- energy gap, nonlocal correl. effect 3=20137
- gas, electrical conductivity 3=11840
- Hall effect at 4.2°K 3=840
- ions, energy loss processes in rare gases 3=19186
- ions, Li⁺—Li charge exchange, resonant 3=16909
- ions, Li²⁺—Li charge exchange, resonant 3=16909
- ions, Li⁺, S-states, variational calc. 3=22471
- K-emission bands meas. 3=8605
- liquid, conduction e.s.r. 3=5450
- liquid, viscosity, effect of isotopic mass 3=125
- magnetoresistance 3=10726
- moving edge dislocations 3=10654
- n.m.r. saturation at 10.7 Mc/s 3=8736
- orthogonalized plane wave form factors 3=25229
- particle detectors, high-energy 3=17114
- twilight emission, changes in Nov. 1962 3=13782

Lithium — contd

- twilight, high abundance, due to thermonuclear explosion,
high altitude 3=18554-5
vapour pressure, correlation 3=14423
vibration spectra and spec. heat, calc. 3=12914
X-ray emission spectrum, valence band 3=8606
in GaAs, solubility and electrical behaviour rel. to
doping 3=10818
Li₂ molecule, electronic structure, LCAO
computation 3=25098
Li⁷ diffusion through W, 1500°K 3=8455
Li⁺-H₂ interaction, 5 to 25 keV 3=4005
Li⁺-He interaction, 5 to 25 keV 3=4005
Li⁺, 1s2s ³S level 3=2569
Li⁺, photo-ionization 3=25047
Li⁺, 2³S state, twenty-parameter calc. 3=2561
Li⁺, Lamb shift of first excited state 3=7328
Li⁺, photoionization cross-section calc. 3=5621
Ni-C, crystallization, effect on, as impurity 3=16115

Lithium compounds

- ferrites, elastic props., anomalies 3=5061
fluoride, liquid, adiabatic compressibility, from u.s.
vel. 3=5440
halides, aqueous solutions, u.s. velo. adiabatic com-
pressibility 3=18812
halides, aqueous solutions, u.s. velo., adiabatic
compressibility 3=18812
halides, diffusion of He, prod. by n irradi. 3=15508
T release, thermal, on neutron irradiation 3=23552
Li ferrite, disordered, ferrimag. reson. 3=5033
Li ferrite (Fe₂LiO₄), ordered, Fe⁵⁷ n.m.r. 3=1204
Li ferrite, square-loop props., effect of grain
size 3=15876
LiAl, n.m.r., rel. to crystal structure 3=11122
LiAlF₄, i.r. absorption spectrum of vapour 3=22553
LiBO₂, thermodynamics of vaporization 3=25809
LiBO₂, vaporization, mass-spectrometric study 3=25807
LiBr, energy losses of 30 kV electron beam 3=15478
LiBr, fused, refractive index rel. to temperature 3=11796
LiBr, spin-lattice relaxation due to translational
diffusion 3=18143
LiBr, spin-lattice relax., temp. depend. 3=11118
Li₂C₂, unit cell, space group, X-ray diffn. 3=6843
Li₂CO₃, thermodyn. props. at high temps. 3=22663
LiCaCl₂·2H₂O, antiferromag. resonance at liq. He
temp. 3=15929
LiCl, energy losses of 30 kV electron beam 3=15478
LiCl, fused, refractive index rel. to temperature 3=11796
LiCl, i.r. spectra, by matrix isolation 3=22544
LiCl, K-absorpt. spectrum of Cl 3=6660
3LiClO₃·H₂O, X-ray K-absorpt. spectra of Cl 3=23090
LiClO₄·3H₂O, X-ray K-absorpt. spectra of Cl 3=20498
LiCrGeO₄, tetrahedral coord. of Li, i.r. spectrum 3=13175
Li₂CrO₄, n-irradiated, thermal annealing
kinetics 3=17700
LiCuCl₂·2H₂O, n.m.r. and heat capacity studies rel. to
antiferromagnetism 3=1205
LiD, rotational mag. moment 3=15337
LiF, absorpt. and refl. spectra in u.v. 3=8596
LiF, absorption spectrum, vacuum u.v., β-irrad. effect
of bleaching and immersion 3=13178
LiF, adsorbed water, dielectric admittance 3=10880
LiF, Bordoni peaks 3=23294
LiF cleavage plane, He and Ar molec. beam
scattering 3=2680
LiF, coloration by various radiations 3=25298
LiF, colour centres 3=22836
LiF, colour centres, identification 3=10694
LiF, colour centres due to electron pulses 3=8460
LiF, colour centres, by irradiation, line and band
spectra 3=6540
LiF, colour centres rel. to flow stress 3=2835
LiF, coloured, sharp absorpt. lines meas. 3=814
LiF, crystal dislocations, jump motion, etching
effect 3=20201
LiF, crystal growth 3=18261
LiF, crystal growth, by floating zones 3=6825
LiF, crystal growth, dry method 3=23404
LiF crystals, deformation, effect of surface
charge 3=6773
Lithium compounds—contd
LiF, damage by sliding and wear 3=11189
LiF, dielec. props. and thermolum. after X-irrad. 3=8479
LiF, dielectric const., 8 mm, by shorted-line wave-
guide 3=22973
LiF, dislocation mobility theory rel. to flow stress 3=5070
LiF, dislocations around indentations, rel. to
strength 3=12970
LiF, dislocations, Peierls stress 3=18165
LiF, elec. cond. rel. to irradiation 3=22981
LiF, elastic limit of whiskers 3=15981
LiF, energy losses of 30 kV electron beam 3=15478
LiF, etching, kink kinetics 3=11221
LiF extreme u.v. absorption spectra, rel. to exciton
interaction 3=10955
LiF, F-centres, e.s.r. study 3=11114
LiF, F₂⁻ centres, rel. to specific heat 3=15439
LiF films, deposition, stress and surface temp. 3=16142
LiF, films evap. on C, growth and structure 3=1375
LiF, fission-fragment damage, surface structures 3=22863
LiF, fracture on (110) planes 3=23354
LiF, friction force on moving edge and screw
dislocations 3=17728
LiF, fused, refractive index rel. to temperature 3=11796
LiF, γ-irrad., F and M-centres 3=25300
LiF, i.r. absorption and dispersion, calc. 3=15684
LiF, i.r. absorption at longit. optic freqn. 3=15663
LiF, i.r. absorption, γ-irrad. effects 3=25449
LiF, i.r. spectra, by matrix isolation 3=22544
LiF, i.r. spectra in solid Ar, Kr and Xe matrices 3=8261
LiF₂, i.r. spectra in solid Ar, Kr and Xe matrices 3=8261
LiF, lattice defects, rel. to neutron irradi. 3=22702
LiF, lattice parameter changes, rel. to cold
working 3=8838
LiF, lattice vibration spectrum, calc. 3=6466
Li⁶F¹⁹, microwave spectrum, dipole moment 3=10510
LiF, Na Diffusion 3=22817
Li⁻F, neutron-irrad. effects, -195° to 100°C 3=22870
LiF, neutron-irrad. effects, rel. to defect
growth 3=22868
LiF, neutron-irrad., elec. cond., effect of irradiation
temp. 3=2946
LiF, pipe diffusion of Na 3=10687
LiF, quantum-mech. box model 3=4796
LiF, reflectivity 400 to 1400 Å, and incremental absorption
rel. to X-irrad. (100 to 170 mμ) 3=13145
LiF, secondary emission, by K ions 3=16978
LiF, spectrum, absorpt., sharp lines due to
X-irrad. 3=23073
LiF, surface damage by fission fragments 3=17804
LiF, surface defects, high temp. processes 3=20214
LiF, tensile strength of whiskers, meas. 3=25640
LiF, thermoluminescence after γ and
neutron irradi. 3=11018
LiF, thermoluminescent dosimetry 3=17116
LiF, vac. u.v. spectral transmittance 3=15682
LiF whiskers, tensile strength, defect effects 3=25641
LiF with impurity valence changes, e.s.r. 3=1180
LiF, X-ray patterns, unusual effects, rel. to neutron irradi.
and deformation 3=20948
LiF: Co, optical props. and electron emission 3=8598
LiF-KF molten system, molar mixing enthalpies 3=21338
LiF, Mn²⁺ e.s.r. 3=13303
LiF₂, U-activated, luminescence; "relaxation
spectra" 3=3035
LiF-U, luminescence, combined magneto-electric dipole
transitions 3=20516
LiF: U, piezospectr. effect and luminesc. 3=8619
LiFe, Kapitza resistance meas. 3=12017
Li_{0.5}Fe_{2.5}O₄, n.m.r. of Fe⁵⁷, temp. depend. 3=8733
LiGa, n.m.r., rel. to crystal structure 3=11122
LiH, electron structure orbital theory 3=2600
LiH, electronic structure, Li⁷ quadrupole
moment 3=25099
Li^{6,7} H molecular consts. 3=4752
LiH molecule, magnetic susceptibility and
shielding 3=8260
LiH photon absorption meas. 3=14948
LiH, π⁻ at rest + p - π⁰ + n to stopped π, ratio 3=19677
LiH, polymorphism, < 6 k bar? 3=8794

Lithium compounds—contd

- LiH, positron long lifetime meas. 3=20148
- LiH, rotational mag. moment 3=15337
- LiH, valence bond theory 3=6375
- LiH, wavefunctions 3=12806
- LiH₃(SeO₃)₂, piezoelec., ferroelec., pyroelec. and elastic constants 3=10881
- LiIn, n.m.r., rel. to crystal structure 3=11122
- LiK₂P₂O₇·H₂O, crystal structure 3=8858
- Li—Mg—Al—SiO₃ glass, rare-earth activated, stimulated emission 3=7736
- Li—Mg, martensitic transform., rel. to elastic constants 3=5125
- Li—Mg—SO₃, Gd³⁺-activated glass, u.v. stimulated radiation 3=3042
- LiMn ferrite, effect of Li subst. on mag. props. 3=15891
- LiMnPO₄, n.m.r. of Li⁷ and P³¹, analysis 3=18151
- LiN₂D₂SO₄, γ-irrad., e.s.r. 3=13302
- LiN₂H₂SO₄, ferroelec., e.s.r. 3=13302
- LiNO₃, fused, refractive index rel. to temperature 3=11796
- LiNO₃, heat of fusion, entropy 3=21617
- LiNO₃, molten, thermal diffusion of Li 3=131
- LiNO₃, fused, splitting of Raman frequencies 3=4761
- LiNO₃, solutions, aqueous, compressibility, adiabatic lowering 3=18807
- LiNbO₃, crystal structure by neutron diff. 3=23454
- LiNiZn ferrites, square hysteresis loops 3=15866
- Li₂O, thermodynamics of vaporization 3=25809
- LiOD, i.r. absorpt. spectra, interpretation 3=13176-7
- LiOH, i.r. absorpt. spectra, interpretation 3=13176-7
- LiOH·H₂O, OH bond orientation 3=4968
- Li₂(Si₂Ge₂)O₇, mixed crystals, vibr. spectra 3=10579
- Li₂SO₄, fused, refractive index rel. to temperature 3=11796
- Li₂SO₄·H₂O, coherent Bragg scattering of neutrons 3=1312
- Li₂SO₄·H₂O, crystal structure 3=16080
- Li₂SO₄·H₂O, n.m.r. 3=8728
- Li₂SO₄·H₂O, OH bond orientation 3=4968
- LiTi ferrite, nonlinear effects at high powers, elec. cond. effect 3=15887

Loudness

See Hearing; Intensity measurement, acoustics.

Loudspeakers

See Acoustic radiators.

Low-temperature phenomena

- See also Helium, liquid; Helium, solid; Joule—Thomson effect; Superconductivity; Superfluidity.
- alkali metal halides, diffusion of inert gases, enhancement 3=15508
- β-ray anisotropy of Co⁶⁰ decay in Fe—Co alloy at 10⁻⁴ °K 3=4590
- conference, Kiev, Oct. 1961 3=24124
- corundum, Ti³⁺ spin—lattice relax time 3=6752
- crystals, isolated, temp. oscillations with mag. field 3=2743
- cubic lattices, Green's thermodynamic functions for ferromagnetics 3=8648
- hydrogen, diffusion, 20.35°K, simplified theory 3=8312
- magnetic induction meas. in high fields, CoSO₄·7H₂O 3=6689
- metals, plastic deformation, thermal activation energies 3=25622
- metals, thermal expansion, Grüneisen's const., low temp var. 3=15446
- nuclear spin diffusion, strain interruption 3=3186
- organic compounds, quasilinear spectra in paraffin solid solutions 3=18012
- phosphorescence lifetimes of organic crystals 3=13211
- polytetrafluorethylene, specific heat, from force consts. 3=8366
- semiconductors, conductivity, electrical, impurities 3=22910
- u.s. vel. oscill., changes with var. mag. field, Bi, 4° K 3=8402
- Al, irradiation effects, 4° K 3=10698
- Al, magnetoacoustic res. 3=6469
- BeO, irradiated, specific heat, below 4°K, and He diffusion after annealing 3=15509
- Bi with Sb impurities, der Haas—van Alphen effect 3=3083
- CaF₂:Eu²⁺(0.01%) crystal, Zeeman effect, 4130 Å, 4.2°K 3=17983
- CdS, optical absorption, 4.2°K, and excitons 3=8594

Low-temperature phenomena — contd

- CeCl₃·7H₂O, paramagnetic relaxation 3=8718
- CoCs₂Cl₂, Zeeman effect, 20-1.6°K, 15-40 kG 3=13166
- Cr³⁺, e.s.r. in CdS, 1.4° K 3=23226
- Cu, irradiation effects, 4°K 3=10698
- D₂, solid, para-enriched, λ-anomaly in specific heat 3=2732
- DyCl₃·6H₂O, paramag. relax., 1.1-4.2°K, 2-2660 c/s 3=8719
- ErCl₃·6H₂O, paramag. relax., 1.1-4.2°K, 2-2660 c/s 3=8719
- Fe, elec. cond., 0.38-4.2°K 3=6560
- Ga, resistance rel. to current, 1.2° to 1.4°K 3=17817
- Ga, very pure, conductivity, electrical, temp. depend. 3=22892
- GdCl₃·6H₂O, paramag. relax., 1.1-4.2°K, 2-2660 c/s 3=8719
- Ge, magnetoresistance, heavily doped, 1.6-4.2°K 3=22929
- Ge, thermal expansion, 2 - > 42°K 3=15443
- H, para, conversion on MgO adsorbed equilibrium, below 20°K, endothermic 3=20994
- H₂, specific heat, constant vol., 15-90°K, up to 340 atm. 3=11784
- H₂, D₂, solid, films, free radicals, prod. by p and d bombardment, 100-1000 V, e.p.r. 3=10550
- In, lattice specific heat, below 1°K, calc. from vib. spectrum 3=8348
- La₂Co₂(NO₃)₁₂·24H₂O, phonon scatt. and thermal resistivity 3=15427
- α Mn Mn⁵⁵ n.m.r., 1.5° to 4.2°K 3=15960
- Na, annealing effect, 5°K 3=8445
- NdCl₃·6H₂O, paramag. relax., 1.1-4.2°K, 2-2660 c/s 3=8719
- Ni²⁺, in AgBr, AgCl, paramag. reson. and relax., liquid H temps. 3=13307
- Pb, specific heat, 0.3°-4°K 3=10601
- Pd₂H, energy evolution below 1°K 3=9665
- PbTe, magnetoresistance p-type, 4.2°K, oscills. with increasing mag. field 3=15595
- Te, paramag. reson., 1.5-60°K 3=13308

Low-temperature production

See also Joule—Thomson effect; Liquefaction, gases; Magnetic cooling.

- adiabatic demagnetization, thermodynamics 3=14431
- gas refrigeration, McMahon—Gifford system, thermodynamic analysis 3=16848
- liquid-helium cooled finger for electron microscope 3=24126
- nuclear spin cooling by paramag. electron spins in lattice 3=19077-8
- by rotation, nuc. polarization prodn. 3=14432
- ruby, optical pumping, cooling effect 3=15660
- temp. regulator, down to 78°K, slow-neutron transmission expts. 3=12478
- thermoelectric refrigeration, theory 3=359
- He³ osmosis effect in liq. He⁴, for <1°K 3=5565

Low-temperature technique

- cold trap, automatic filling with liq. N₂ 3=18867
- conference review, California, Aug. (1962) 3=16846
- cryostat, -20° to -140° C 3=19080
- dewar checking apparatus 3=19079
- ferromagnetic resonance meas from liquid nitrogen temp. 3=24502
- gasifier for obtaining He gas pressures up to 100 atm. 3=12013
- H₂ vapour pressure measurement, 2.5° to 4.2°K, u.h.v. conditions 3=12008
- level indicator, He, liquid, dielectric 3=21648
- liquid-He temp. regulator 3=24128
- liquid-hydrogen targets made from Mylar 3=7396
- liquid-level indicator for opaque cryostats 3=24127
- liquid level, stethoscope sensing 3=16567
- liquid N₂ automatic level controller 3=24125
- low-temp. conference, Kiev, Oct. 1961, papers included 3=24124
- magnetic field measurement, high 3=5805
- paramagnetic resonance, resonator, X-band 3=5884
- specimen changing in liquid helium 3=7397
- spectrophotometer, absorption cell, double beam 3=5518
- steels, suitable 3=16847
- thermal cond. meas., thermal resistors 3=14433
- thermometers, resistance, Pb-brass 3=14430
- thermometers, resistance, SiC, 4-10°K 3=9666

Low-temperature technique — contd

- vacuum pumps, cryogenic, phys. princs. 3=11841
- vacuum valve, packless, all-metal for 743° - 77°K 3=7257
- X-ray spectroscopy, camera 3=21921

Lubrication

See also Friction

- film thickness det. with scintillation counter 3=96
- friction of clean metals immersed in liquid Na 3=1249
- magnetohydrodynamic, principles of 3=24446
- Teflon-steel, Teflon-Teflon bearings 3=9393
- viscosity, oils, reduction at high shear stress 3=9422

Luminescence

See also Electroluminescence; Luminescent devices; Spectra, resonance; Thermoluminescence.

- activation energy calc. from temp. dependence 3=3031
- admixture centres, adiabatic approx. theory 3=18018
- atomic, L-shell fluoresc. yields in heavy elements 3=19953
- biography, S.I. Vavilov 3=9312
- cathodoluminescence, kinetics and efficiency 3=971
- chemi, for wind study, night, upper atmosphere. 3=25918
- circuit, decay time meas., 10^{-2} - 10^{-5} sec 3=14478
- conference, Moscow (1961) 3=8612
- conference, Moscow, 1961, opening address 3=10978
- conference, 1961, Balatonvilagos 3=13194
- crystals, book monograph 3=6664
- crystals with rare-earth ions, fluorescence spectra 3=12350
- decay meas., by spectroscopic light source with chopper, electronic 3=21554
- decay meas., $\sim 10^{-4}$ sec., oxygen phosphors, u.v. 3=8614
- de-excitation effect of X-rays 3=13197
- electrolysis, Al, near anode and cathode, flash spectra 3=10984
- fluorescence emission anisotropy meas. 3=11900
- fluorescence, lifetime and intensity relationship 3=8613
- fluorescent materials, incident radiation—emitted radiation relationship, photometry 3=18019
- fluorometer, double-beam 3=21013
- fluorometer, lifetimes, 10^{-8} - 10^{-9} sec, by modulated light 3=5514
- fluorometer, phase-sensitive, lifetimes meas. 3=3869
- ionic crystals, centres, electronic—vibrational processes 3=20501
- light-yield meas. of large scintillators 3=24001
- lubricant films, thickness det. 3=96
- meas., nanosec decay region 3=15697
- measurement, phosphoroscope for study of decay at different temps. 3=18020
- meas., stroboscopic, electronic instrumentation, simple 3=13198
- microscopy 3=24012
- molecular crystals, impure, quenching 3=20144
- molecules, complex, theory 3=10488
- molecules, polarization meas., photoselection method 3=15370
- molecules, universal reln. to spectra, rel. to excited states 3=15320
- molecules, use in biological research 3=13942
- nonradiative transitions in local centre, theory 3=15455
- optical-maser materials, meas. with Michelson interferometer 3=7353
- organic molecules, fluorescence symmetry rel. to electronic transitions 3=2635
- organic molecules relation to absorption spectra, mirror-image relation 3=23892
- organic substances, α -phosphorescence rel. to temp. 3=3063
- oxygen phosphors, u.v., decay meas., $\sim 10^{-4}$ sec. 3=8614
- paints, colour rel. to light source 3=14307
- photographic emulsions, temp. depend. 3=16813
- polarization 3=18017
- powders, rel. to optical constants 3=10901
- practical uses, Communist Party congress 3=15701
- quenching, effect of reabsorpt. by mols. 3=3032
- radiationless transitions, theory 3=6646
- radioluminescence, yield rel. to particle energy 3=2609
- rigid solns., concn. depolariz., active sphere model 3=140
- sensitized, radiationless energy transition 3=13195
- solids, activator concentration depend., formulae, approx. 3=20502

Luminescence — contd

- solids, kinetics and decay laws 3=15698
 - spectrofluorimeter, double beam 3=3880
 - spectrophotometer, a.g.c. amplifier to correct for light source varns. 3=5605
 - stabilization by adjustment of excitation voltage 3=1806
 - thermal extinction energies calc. 3=25477
 - transition probabs., radiative, in $4f^n$ configs. 3=25482
 - two-component mixture, migration and energy transfer 3=13196
 - Vavilov's work 3=16479
 - Vavilov's work 3=16480
 - Vavilov's work 3=16481
 - Vavilov's work 3=16483
 - X-ray fluorescence, radiation transfer calc., matrix effect 3=18016
 - yield rel. to decay rate under strong excitation 3=18015
- gases**
- α excited, weak, meas. 3=21447
 - fluorescence, photo-induced 3=9509
 - inert gases, due to ionizing radiation, increase due to electric field, pulsed 3=16664
 - inert gases, rel. to X- or α -irrad., in elec. fld. 3=21448
 - by ionizing radiation, increase due to electric field, pulsed 3=16664
 - in liquids, by cavitation, u.s. induced 3=18819
 - resonance fluorescence, theory 3=14219
 - terphenyl, effect of adsorption on fluoresc. spectrum 3=8932
 - water vapour, fluorescence, possibility 3=9513
 - CO, vibrational fluorescence 3=16665
 - CO⁺, u.v. excited, fluorescence 3=4753
 - CS₂, afterglow spectrum 3=11839
 - Hg vapour, fluorescence 3=14221
 - I₂, 5525.1 Å line, by 5461 Å Hg line, amplification coeff. 3=12769
 - I₂, radiative lifetime 3=11838
 - Kr, α excited, weak, 2400-5000 Å 3=21447
 - Kr, X-ray excited, increase due electric field, pulsed 3=16664
 - Mg-Na vapour mixture 3=705
 - N₂, excited by vac. u.v. 3=14220
 - N⁺, u.v. excited, fluorescence 3=4753
 - NO, energy transfer 3=8265
 - NO, lifetime of A² Σ^+ state 3=23936
 - NO, vibr. energy transfer between NO A² Σ^+ ($v=3,2,1$) and N₂ X¹ Σ_g^+ ($v=0$) 3=23937
 - O₂, fluorescence, possibility 3=9513
 - O₂⁺, u.v. excited, fluorescence 3=4753
 - Xe, α excited, weak, 2400-5000 Å 3=21447
 - Xe, X-ray excited, increase due to electric field, pulsed 3=16664

Liquids and solutions

- acridone solns., no evidence of association 3=141
- 3-aminophthalimide, active and nonactive absorption separation 3=18822
- anthracene, solutions, delayed fluorescence 3=142
- aromatic hydrocarbons dissolved in plastics 3=7213
- 1,2-benzanthracene derivs., "excimer" fluorescence 3=21383
- benzene derivatives and cyclo-paraffins 3=21380
- biacetyl, in cyclohexane, benzene sensitization, by triplet-triplet transfer 3=18820
- biacetyl, energy-transfer from aromatic hydrocarbons and ketones 3=23890
- biacetyl, sensitized fluorescence in soln. 3=16631
- benzene, triplet state in sensitization of biacetyl 3=16630
- castor oil under a.c. voltage 3=16634
- cavitation, u.s. induced 3=18819
- colour quenching, quantit. interpretation 3=21381
- decay times, true and measured 3=16633
- 9,10-dibromoanthracene, first order triplet decay, rate const. 3=3811
- dyes, appl. in biology 3=9469
- dyes dissolved in polyvinyl alcohols 3=7213
- dyes in solution, triplet-singlet emission 3=11800
- energy-transfer studies by spectrophotofluorometric method 3=23890

Luminescence—contd

liquids and solutions—contd

- energy transport phenomena in solns. 3=3806
- eosin, in polymethyl methacrylate, polarization 3=15713
- eosin, spectrum, influence of solvent mixture of MAM or ethanol 3=21378
- fluorescein, active and nonactive absorption separation 3=18822
- fluorescein, aq. soln., various ionic forms 3=3809
- fluorescein, ionic forms, neutral salt effects 3=7212
- 9-methylantracene and perylene, excitation energy transfer, investigation 3=23887
- molecular electron spectra, solvent influence 3=18823
- naphthalene added, quenching effect 3=11801
- naphthalene in n-pentane, at 4°K 3=17605
- naphthalene solvent, energy transfer processes 3=18821
- nitrogen heterocyclics, spin-orbit coupling and radiationless processes 3=17604
- organic, β -phosphoresc., temp. quenching 3=10999
- organic, emission spectra 3=9464
- organic mols., reson. interactions 3=7215
- organic phosphors, energy transfer mechanism 3=6681
- organic solns., for scintillators, non-radiative transfer 3=10001
- oxadiazoles, fluorescence rel. to 1-methylnaphthalene 3=18815
- oxazoles, fluorescence rel. to 1-methylnaphthalene 3=18815
- phenanthrene, solutions, delayed fluorescence 3=142
- polyenes, substituted, in various solvents 3=23891
- POPOP, solvent effect, electronic spectra 3=25127
- porphyrins 3=9467
- pyrene in ethanol, delayed and normal, spectra 3=14174
- quenching, association theory and energy migration, dyes 3=9466
- quenching by foreign substs. in solns. 3=7214
- quenching by foreign substances 3=21382
- quenching by oxygen, solute mols. in cyclohexane soln. 3=3810
- quenching, resonance in diffusion, theory 3=9465
- rhodamine B, 6G, in polymethyl methacrylate, polarization 3=15713
- rhodamine B, spectrum, influence of solvent mixture of MAM or ethanol 3=21378
- rhodamine dye, active and nonactive absorption separation 3=18822
- scintillation characteristics, rel. to γ -irradiation 3=9470
- singlet-singlet energy transfer in solutions 3=16631
- solutions with donor and acceptor molecules, phosphorescence 3=11799
- solutions, impurity quenching, rel. to viscosity 3=16632
- solutions, solvent relaxation during solute excited lifetime, spectral effects 3=9468
- solutions, yield rel. to exciting wavelength, theory 3=1695
- sonoluminescence, thermal cond. effects 3=18818
- sphere of action in concentration depolarization 3=3808
- triplet-singlet emission in solutions 3=11800
- tryptaflavine soln. 3=9469
- uranin dye solns., polarization and decay 3=23893
- uranin, soln., depolarization by thermal rotation of molecules 3=139
- water, detonation transmission 3=21379
- xylene-based scintillators, intermediate transfer of excitation 3=16629
- Co²⁺ in organic solvents, centres 3=10923
- Eu chelates, in soln. 3=20513
- Eu dibenzoyl-methide, fluorescence time variation, under flash excitation 3=23886
- Eu thenoyltrifluoroacetate in acetone, absolute quantum efficiency 3=23889
- Eu thenoyltrifluoroacetate, lifetime, quantum yield 3=23888
- GdCl₃ 3=10988
- Gd(EtSO₄)₃ 3=10988
- Gd₂(SO₄)₃ 3=10988
- He II, due to 5.3 MeV α 's, inhibition below λ point 3=21644
- Hg in quartz tube being evacuated 3=14171-2
- Na fluorescein, aq. soln., foreign additive quenching 3=3807

Luminescence—contd

liquids and solutions—contd

- Na-fluorescein, lumin. quenching in aq. and glycerin solutions 3=14173
- Ni²⁺ in organic solvents, centres 3=10923
- Tl salts, with alkali halides 3=5446
- solids, inorganic**
- activation by tetravalent Mn 3=3043
- alkali fluorides, U activated centres 3=25478
- alkali halides activated by CuBr, narrow bands 3=3040
- alkali halide crystals containing Sm²⁺ 3=23079
- alkali halide crystals, X-rayed and plastically deformed 3=4983
- alkali halide phosphors 3=23100
- alkali halide phosphors, activator distrib. 3=947
- alkali halide phosphors, Ag activated, quenching 3=944
- alkali halide phosphors, crystals and solutions, activator trapping centres, absorption and emission 3=20504
- alkali halide phosphors, intracentre lumin. 3=945
- alkali halide phosphors, long wavelength emission 3=943
- alkali halide phosphors, Sb-activated 3=948
- alkali halides, Cu-doped, mechanism 3=6687
- alkali halides, Cu-doped and pure 3=20505
- alkali halides, Tl-activ., internal kinetics 3=18023
- alkali halides, vac. u.v. 3=10964
- alkali iodides, unactivated 3=18024
- alkaline earth aluminates, activated 3=25479
- alkali earth fluorides, Sm²⁺ and Eu²⁺ activated, deformation line-splitting 3=18025
- α -centres in alkali halides, fluorescence 3=17796
- candoluminescence, rel. to Vavilov-Wiedemann criterion 3=20546
- cathodoluminescence, trapping mechanism 3=3064
- chalcogenides, conference 3=10977
- chemiluminescence, from O and N reactions 3=25819
- crystal phosphors, excitation energy storage, transfer 3=15
- cyanoplatinate (II) salts, as γ -detectors 3=6668
- decay time meas. 3=10005
- Dember effect in ZnS-type materials 3=910
- diamond, thermal rel. to optical activation 3=20547
- elements, light, X-ray fluoresc. meas. 3=3033
- fluorescence rel. to activator concn., calc. 3=10980
- fluorite, natural and synthetic 3=15703
- fluorspar 3=8616
- glass, i.r. stimulated, lifetime 3=10989
- glass scintillator for slow neutrons, γ -ray background 3=10132
- glasses, Cr-activ., temp. depend. 3=25483
- halophosphate phosphors, effects of u.v. irradiation 3=10991
- hydrazoic acid, from shock wave 3=12876
- ionic solids, relation of absorption to emission probabilities, theory 3=6666
- line luminescence of activated crystals 3=18021
- metal difluoride crystals, with rare-earth ions, line fluorescence 3=18021
- metals, heavy, halide salts 3=10990
- microcrystalline grains, absorpt. coeff. meas. 3=4980
- non-photocond., temp. depend. of intensity 3=4981
- phosphor research, Moscow electric lamp plant 3=15700
- phosphors, conduction electron spin resonance 3=20642
- phosphors, energy transfer mechanism 3=6681
- phosphors with hole and electron traps, kinetics 3=942
- phosphors, penetration depth of 10-80 keV electrons 3=10701
- platinocyanides, decay var. with excitation and non-monomolecular processes 3=18030
- rare earth chlorides, hydrated, luminescence, compared with chelates, 90, 300°K 3=11001
- rare earth divalent ions, selection rules 3=13204
- rare-earth phosphors, red emission under u.v. excitation 3=13206
- rare-earth tungstates and 1:1 oxytungstates 3=23105
- recombination effects 3=20503
- resonance fluorescence in molecular crystals, theory 3=14219
- ruby, energy level schemes 3=13201
- ruby, excited by fast electrons and u.v. light 3=4991
- ruby, yield rel. to wavelength 3=25484
- scintillators, regeneration 3=23119

Luminescence — contd**solids, inorganic — contd**

- semiconductors, fluorescence, rel. to impurity levels 3=10733
 signs of charge carriers, Hall apparatus 3=10979
 spectroscopic analysis of impurities for 8 phosphors 3=941
 sulphide phosphors, emission growth meas. 3=3046
 symposium, Prague (Sept. 1962) 3=6665
 thin films, cathodoluminesc. analysis 3=11004
 transition elements, X-ray excitation 3=953
 II–VI compounds, double acceptor lumin 3=15704
 X-ray fluorescence, rel. to internal electric field meas. 3=10972
 AgBr, CdS-doped, meas. and model 3=18006
 AgCl, blue-green emission, Stark effect 3=18031
 AgCl, doped with divalent anions and cations 3=23106
 AgCl, electron trapping centres, nature 3=20521
 AgCl, growth kinetics and activ. energies 3=18033
 AgCl, pure and doped 3=25486
 AgCl, trapping level spectrum, thermal effects 3=8397
 AgCl, by X-rays and β -rays 3=6671
 AgCl: Mn, burst of red Mn band 3=20522
 AgCl: Tl, temp. depend. in red region 3=18032
 Ag halides 3=12940
 Al, under a.c. electrolytic oxidation 3=10983
 AlLaO₃, perovskite, doped with various Cr concs. down to 4°K 3=15702
 AlLaO₃, La³⁺ replaced by Nd³⁺, Al³⁺ by Cr³⁺ 3=15670
 AlN, cathodoluminescence 3=13213
 Al₂O₃ layer during electrolytic formation, u.v. 3=8615
 Al₂O₃ layers, fluorescein-activated, theory 3=3036
 Al₂O₃–AlN systems 3=10985
 Al₂O₃: Cr, dimers and polymers, var. with Cr conc., reabsorpt. 3=20510
 BaF₂, Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
 BaF₂: Sm²⁺, kinetics and theory 3=4986
 BaF₂, U-activated, "relaxation spectra" 3=3035
 Ba₂ZrAs₂O₉ 3=10982
 Ba₂ZrP₂O₉ 3=10982
 BeAl₂O₄: Cr, kinetics and model 3=20511
 BeO, electron excitation 3=15717
 BeO, vacuum u.v., cathodoluminescence 3=13178
 Ca halophosphate, Mn, Sb-activ., effect of cooling 3=3038
 CaF₂: Dy³⁺ fluoresc. rel. to crystal field levels 3=25481
 CaF₂: Er³⁺, multistage radiative transitions 3=18027
 CaF₂: Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
 CaF₂: Nd³⁺ 3=13167
 CaF₂: Sm³⁺, fluorescent spectra 3=13203
 CaF₂: Sm²⁺, Zeeman effect 3=18026
 CaF₂: Tm³⁺, 4f → 4f, selection rules 3=13204
 CaMoO₄, effect of SrO, BaO, ZnO, CdO inclusion 3=20508
 CaO, oxygen treated, electron excitation 3=15717
 CaO, thermostimulated 3=419
 CaO, vacuum u.v., cathodoluminescence 3=13178
 CaO: Mn, Li phosphors, H₂ or N₂-fired 3=3039
 Ca phosphate phosphors, for lamps 3=972
 CaS, Mn activator incorporation 3=12965
 CaWO₄, Nd³⁺ fluorescence excitation 3=13199
 CaWO₄, by X-rays, wavelength depend. 3=4682
 CaWO₄, ion excitation, damage 3=970
 CdCl₂, sulphide activated, prepn., props. 3=950
 Cd₂Cl(PO₃)₂: Mn, quantum efficiency 3=13200
 CdS, blue and green fluorescence under u.v. excitation, 4·2° and 77°K 3=949
 CdS, bound exciton complexes, props 3=6651
 CdS, cathodo 3=23118
 CdS crystals, 300°–70°K 3=13202
 CdS, double acceptor luminescence 3=15704
 CdS, edge emission line, temp. depend. 3=25480
 CdS, exciton stimulation 3=10986
 CdS, fluorescence, use in optical maser 3=526
 CdS, i.r. effect, and anti-Stokes emission 3=3049
 CdS, i.r., rel. to heat treatment 3=17954
 CdS, ion excitation, damage 3=970
 CdS, large crystals, rel. to defects 3=17704
 CdS, spectrum, comparison with electroluminescence 3=8632
 CdS, temp. depend., photochemistry 3=15705

Luminescence — contd**solids, inorganic — contd**

- CdS, trapping-state spectroscopy 3=23101
 CdS, u.v. above 0°C, photochem. effects 3=3037
 CdS: V, CdSe: V, crystal fields 3=20530
 CdTe, double acceptor luminescence 3=15704
 Ce³⁺ in alkaline earth fluoride crystals 3=25452
 CeCl₃–PrCl₃, mixed crystals, fluorescence 3=15706
 Cr–Al₂O₃·Ga₂O₃, rel. to structure and deformations 3=20512
 CsBr: Tl, scintillation and particle type discrimination 3=24551
 CsI: Tl, decay time meas. 3=10005
 CsI: Tl, intracentre luminescence 3=945
 CsI: Tl, neutron excitation, 14.6 MeV 3=12689
 CsI: Tl, photopeak efficiency, response function, to 11 MeV 3=6670
 CsI: Tl, scintillation process 3=20506-7
 CsI: Tl, X-ray and γ -ray fluorescence 3=13215
 CuBr, narrow bands at 20° and 77°K 3=3040
 Cu₂O, effect of O vacancies 3=18029
 Cu₂O, elec. field effects 3=22942
 Cu₂O, i.r., quenching by water and solutions 3=18028
 Cu₂O, short-wavelength bands, relaxation time 3=3041
 Cu₂O, yellow exciton spectra, rel. to neutron-irradiation 3=17998
 Eu³⁺ in Eu dibenzoylmethane 3=3061
 Eu³⁺ in LaCl₃ 3=15683
 Eu³⁺, in tungstates and molybdates 3=10987
 GaAs diodes, 20°–77°K, band-filling model 3=20514
 GaAs, doped, spectra, 77°K 3=8617
 β -Ga₂O₃, temperature and concentration dependence 3=15707
 Ga₂O₃: Cr, relaxation times, various Cr₂O₃ concs., reabsorpt. 3=20509
 GaP, spectrum, 4·2°K 3=8618
 GaP, 1.6°K, pair spectra 3=15708
 GdCl₃ 3=10988
 Gd₂(SO₄)₃ 3=10988
 HgI₂, excitation spectrum, rel. to absorption 3=6669
 In₂S₃, i.r. emission 3=20515
 K halides, recombination 3=3034
 KBr: Tl, emission spectra, at low temp. 3=4984
 KBr: Tl, nature of centre 3=6536
 KCl, optical excitation of I atoms 3=15709
 KCl, plastically deformed, thermal glow 3=969
 KCl, thermal glow, rel. to plastic deformation 3=23104
 KCl: Ag, Pb, fluorescence decay curves 3=23103
 KCl: Co²⁺ and Ni²⁺, centres 3=10923
 KCl: Tl, emission spectra, at low temp. 3=4984
 KCl: Tl and KCl: Pb, rel. to impurities 3=18022
 KCl: Tl, pressure-effect model for luminescent centre 3=10992
 KI: In, intracentre luminescence 3=945
 KI: Tl, decay time meas. 3=10005
 KI: Tl, emission spectra, at low temp. 3=4984
 KI: Tl, by X-rays, wavelength depend. 3=4982
 KMg(Ni)F₃, coincidence with absorption 3=19993
 KMnF₃, temp. var., large 3=23102
 LaF₃: Er³⁺, 3500–10 000 Å 3=25457
 LaF₃: Pr 3=23072
 La₂O₃, cathodoluminescence, activated by rare earths 3=13214
 LiF, colour centres, irradiated 3=6540
 LiF: Co, X-irrad. and non-irrad. 3=8598
 LiF₂, U-activated, "relaxation spectra" 3=3035
 LiF: U, centres, props. and nature 3=8619
 LiF–U, combined magneto-electric dipole transitions 3=20516
 Li–Mg–SO₃, glass, Gd³⁺-activated, u.v. stimulated radiation 3=3042
 MgO, electron excitation 3=15717
 MgO, thermostimulated 3=419
 MgO, vacuum u.v., cathodoluminescence 3=13178
 MgO: V²⁺, strain-induced splitting 3=23108
 Mn activated phosphors, decay of cathodoluminescence 3=3066
 MnF₂, temp. var., large 3=23102
 NaCl, activated by Cd and Co 3=4985
 NaCl, coloured, u.v. and X-ray luminescence 3=813

Luminescence — contd

solids, inorganic — contd

- NaCl, recombination 3=3034
- NaCl whiskers 3=20518
- NaCl:Co²⁺ and :Ni²⁺, centres 3=10923
- NaCl:Cu, meas. 3=18008
- NaCl : Ni, Ca, rel. to dislocations 3=20517
- NaCl:Tl, and NaCl:Ag, rel. to impurities 3=18022
- NaF₂, U-activated, "relaxation spectra" 3=3035
- NaF—U, combined magneto-electric dipole transitions 3=20516
- NaI:Tl crystals, mounting, improved resolving power 3=528
- NaI:Tl, decay time meas. 3=10005
- NaI : Tl, excitation spectra 3=20520
- NaI:Tl, photopeak efficiency, response function, to 11 MeV 3=6670
- NaI:Tl, response function to γ -rays 3=3045
- NaI : Tl, X-ray and γ -ray fluorescence 3=13215
- NaI : Tl, X-ray excitation 3=20519
- NaI:Tl, X-ray excitation, temp. and Tl conc. depend. 3=23107
- Na_{0.5}La_{0.5}WO₄ doped with Tb³⁺ 3=25176
- Nd in SrF₂, 77°K 3=20482
- NH₄ halide phosphors 3=23100
- NH₄ halide phosphors, Tl⁺, Sn²⁺ activated 3=946
- PbI₂, excitation spectrum, rel. to absorption 3=6669
- PbMoO₄ 3=20479
- Pb₂TiP₂O₈ 3=10982
- Pb₂ZrAs₂O₈ 3=10982
- Pb₂ZrP₂O₈ 3=10982
- Pr³⁺ in LaBr₃ 3=3014
- RbI:Tl, scintillation and particle type discrimination 3=24551
- α -SiC, 5450-6700 Å 3=25485
- SiC, 6H, nitrogen—exciton complexes 3=18034
- SiC, semicond., p-n forward bias 3=13082
- SiC, spectra, temp. depend. 3=20485
- Sm²⁺ in alkali halide crystals 3=23079
- SmCl₃ 3=3016
- Sr—B phosphors, oxygen-dominating 3=10993
- SrCl₂ : Sm²⁺, spectra and selection rules 3=13204
- SrF₂, Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
- SrF₂ : Nd, 77°K 3=20482
- SrF₂ : Sm²⁺, kinetics and theory 3=4986
- SrF₂:Sm²⁺, 4f → 4f, selection rules 3=15204
- SrF₂:Sm²⁺, Zeeman effect 3=18026
- SrF₂, U-activated, "relaxation spectra" 3=3035
- SrMoO₄ doped with Tb³⁺ 3=25176
- SrO—CeO₂ 3=6672
- SrS, Mn activator incorporation 3=12965
- Sr₂ZrAs₂O₈ 3=10982
- Sr₂ZrP₂O₈ 3=10982
- 0.9TbCl₃·0.1XCl₃, 6H₂O, X=rare earth ion 3=8620
- Tb hexa-antipyrene tri-iodide, fluorescent lifetime of Tb 3=13205
- Tb³⁺, in tungstates and molybdates 3=10987
- Th₃(PO₄)₄ phosphors 3=20523
- TlCl, rel. to structural defects, plastic deformation and dislocations 3=952
- TlCl, single crystals 3=20799
- YAl garnet, Pr doped 3=23072
- (Zn—Cd)S, chemical nature of activators 3=3051
- (Zn,Cd)S, coactivator emission 3=10998
- (Zn:Cd)S: Ag, 75:25, for temp. meas. 3=8622
- (Zn, Cd)S : Cu, crystal structure, atomic, X, γ -ray effects 3=23457
- ZnCdS—Mn, enhancement by electric field, u.v. excitation 3=6673
- ZnCdS:Mn, prior sensitization 3=10994
- ZnCdS:Mn, by X-rays a.c. components prod, by 10⁴V/cm at 400 c/s 3=15710
- ZnCl₂, sulphide activated, prepn., props. 3=950
- ZnO, cathodoluminescence, polarization 3=957
- ZnO, double acceptor luminescence 3=15704
- ZnO, due to u.v. and electrons, mechanism 3=3047
- ZnO, "edge" and green emission rel. to elec. cond. 3=3048
- ZnO, effect of absorbed O 3=6679
- ZnO, effect of Cu activation 3=20524
- ZnO films, sublimed 3=16144

Luminescence — contd

solids, inorganic—contd

- ZnP₂, red and black forms 3=16072
- Zn₃(PO₄)₂, γ -phase 3=6849
- ZnS, activated, i.r. stimulation and quenching 3=6677
- ZnS, α -ray scintill., field quenching model 3=13208
- ZnS, chemical nature of activators 3=3051
- ZnS, coactivator emission 3=10998
- ZnS, double acceptor luminescence 3=15704
- ZnS, due to incorporation of Cu 3=3069
- ZnS, effect of growth conditions 3=6675
- ZnS, effect of pressure 3=18035
- ZnS, effect of synthesis conditions 3=25487
- ZnS electrophotoluminescence rel. to elec. fld., application 3=966
- ZnS, excitation spectra meas. 3=18037
- ZnS, excitation spectra, theory 3=18036
- ZnS films, sublimed 3=16144
- ZnS, flash, three-trapping-levels model 3=3050
- ZnS, by γ -rays, effect of elec. field 3=8629
- ZnS group, excitation by modulated light 3=20525-6
- ZnS, i.r. effect, and anti-Stokes emission 3=2049
- ZnS, i.r., meas. and model of centre 3=8621
- ZnS, interaction of Ag and Sm activators 3=3057
- ZnS, n irradiated, quenching by Cu or Co 3=18039
- ZnS phosphors, cathodolumin., elec. field effects 3=3065
- ZnO phosphors doped with Li, Ni, Cu 3=23111
- ZnS phosphors, e.s.r. study 3=23112
- ZnS phosphors, emission shifts, rel. to activators, lattice extension and compression 3=8625
- ZnS phosphors, escape of trapped electrons 3=20529
- ZnS phosphors, excitation energy storage, transfer 3=15699
- ZnS, phosphors, 14-77°K and shallow trapping levels 3=23132
- ZnS phosphors with impurities, spectroscopic analyses 3=941
- ZnS phosphors prepared at room temp. 3=10997
- ZnS phosphors, steady-state 3=20527
- ZnS phosphors, u.v.-excited, i.r. effects 3=23110
- ZnS, photoelectroluminesc., u.v. 3=3070
- ZnS, prepared at room temp., under u.v. 3=4989
- ZnS, quenching by heat treatment or neutrons 3=4987
- ZnS, red, preparation conditions 3=18038
- ZnS rel. to crystal size 3=954
- ZnS, rel. to defects 3=22705
- ZnS, self-activated 3=8623
- ZnS, self-activated, polarization, 77°K 3=20531
- ZnS, self- and Cu-activated, meas. 3=11028
- ZnS, temperature dependence, rel. to impurities 3=20528
- ZnS, transition metal impurities, crystal field theory 3=3054
- ZnS, variously activated, blue bands 3=10995
- ZnS, Se: Cu, Cl, recomb. and trapping levels 3=6674
- ZnS type, Dember effect 3=910
- ZnS:Ag, ion excitation, damage 3=970
- ZnS:Al³⁺, correl. with e.s.r. meas., model 3=18128
- ZnS—CdS, Cu activated, reaction enthalpy 3=6678
- ZnS—CdS phosphors, glow maxima, 2·5-77·4°K, and electron traps 3=8429
- ZnS—CdS—Mn, Mn²⁺, excitation bands 3=6676
- ZnS, Cu activated, a.c., pulsed 3=18046
- ZnS:Cu, coactivation by In 3=4988
- ZnS:Cu, conversion of green to blue centres 3=25488
- ZnS:Cu, excited by α -rays and light pulses, kinetics 3=955
- ZnS:Cu, exo-electron emission 3=956
- ZnS:Cu, polarization, theories 3=3056
- ZnS:Cu, prep. by neutron irradi. of ZnS 3=13207
- ZnS:Cu, rel. to incorporation of Cu 3=10996
- ZnS:Cu, rel. to photoconductivity 3=25422
- ZnS:Cu, role of additional impurities 3=8624
- ZnS:Cu, spectral distrib., polarization 3=3055
- ZnS:Cu:Cl, build-up of blue and green bands 3=3052
- ZnS:Cu, Cl, green and blue, rel. to photoconductivity 3=911
- ZnS—Cu, Pb, optical flash regularities 3=3053
- ZnS:Mn, rel. to photoelec. effects 3=15711
- ZnS:Mn, by X-rays, a.c. components prod. by 10⁴V/cm at 400 C/s 3=15710
- ZnS:Tm, strong blue emission 3=13210

Luminescence — contd

solids, inorganic — contd

- ZnS : V, ZnSe : V, crystal fields 3=20530
 ZnSe, double acceptor luminescence 3=15704
 ZnSe, due to electron radiation damage 3=8476
 ZnSe, edge, 4.2°K and phonon, longitudinal, optical 3=23109
 Zn.SiO₂.Mn. trapping centres 3=13209
 ZnTe, at 4.2°K, three types 3=25467
- solids, organic**
- anthracene 3=6628
 anthracene, α -particle scintillation 3=18045
 anthracene crystals 3=20533
 anthracene, crystals, two-photon, laser excitation 3=11002
 anthracene, decay law, reabsorpt. effect 3=8626
 anthracene, decay of slow component 3=20532
 anthracene, directional anisotropy in responses 3=6680
 anthracene, excited by α , p, e, decay law 3=11005
 anthracene, fluorescence, double photon excitation 3=18040
 anthracene, scintillation decay props. 3=6682
 anthracene, triplet excitons and delayed fluorescence 3=18041
 anthrols 3=8287
 aromatic aldehydes, vapour and cryst. soln. 3=961
 aromatic ketones, vapour and in cryst. soln. 3=961
 aromatic, polycyclic, crystals, two-photon, laser excitation 3=11002
 benzene, cryst., low-temp. mechanism 3=11003
 benzene, triplet exciton interactions 3=25492
 benzene, vibronic-spin-orbit perturbations and assignment of lowest triplet state 3=8289
 3,4-benzopyrene, crystals, two-photon, laser excitation 3=11002
 3,4-benzopyrene, delayed fluorescence 3=13212
 3,4-benzopyrene, sensitized, delayed energy greater than incident 3=8627
 3,4-benzotetraphene, delayed fluorescence 3=13212
 biacetyl, phosphorescence quantum yield, fluid and rigid solns., radiative lifetime 3=25489
 boron phthalic phosphors, phosphorescence, -183° to +160°C 3=23113
 chelates, rare earth, compared with hydrated chlorides, 90, 300°K 3=11001
 chrysene, delayed fluorescence 3=13212
 chrysene, 4°K, lifetimes 3=13211
 coronene, delayed fluorescence 3=13212
 crystals, photo- and radioluminescence, duration 3=15716
 cyanuric acid-formaldehyde resins, on addition of aromatic ring compounds 3=15715
 delayed, triplet-triplet annihilation in molecular crystals 3=10981
 diphenylacetylene, decay of slow component 3=20532
 durene, 4°K, lifetimes 3=13211
 durene, naphthalene-doped, phosphoresc. 3=15712
 durene, polarization of green emission 3=23114
 electroluminescence, specimen prep. and meas. 3=965
 N-ethylacridone, triplet states 3=962
 excitation energy migration, polarization prod., model 3=11000
 fluorescein, in boric acid, fluorescence and phosphorescence, different temps. 3=15714
 hexamethylbenzene, 4°K, lifetimes 3=13211
 leaves, green, near i.r. 3=21149
 lifetime in triplet state, meas. method and results 3=960
 molecular crystals, exciton luminescence, role of defects 3=23099
 molecular crystals, triplet-state processes 3=3060
 naphthalene, in durene, 77-325°K, and radiationless transitions 3=23115
 naphthalene, fluorescence spectrum and decay time 3=138
 naphthalene, 4°K, lifetimes 3=13211
 naphthalene, γ -excited, yield depend. on impurity concn. 3=963
 naphthalene, 2°-100°K, fluorescence spectrum 3=25493
 naphthalene-tetrachlorophthalic anhydride, 2-photon excitation 3=25490
 NE 102, 150, 211, 213, 314, scintillation decay props 3=6682

Luminescence — contd

solids, organic — contd

- nitrogen heterocyclics, spin-orbit coupling and radiationless processes 3=17604
 2,2'-paracyclophane 3=4773
 perylene, dispersed in n-heptane, polarization, electric field effects, 77°K 3=18043
 perylene in 2,3 dimethyl naphthalene fluorescence 3=18042
 perylene in 2 methyl naphthalene fluorescence 3=18042
 phthalic acid, in alums, phosphorescence, -183° to +125°C 3=23116
 phthalocyanine with uranyl complex 3=20534
 phenanthrene, 4°K, lifetimes 3=13211
 phenanthrene, polarization 3=3062
 phosphor NE 102, fluorescent yield for 4-17 keV X-rays 3=25494
 plastic scintillators, photo- and radioluminescence, duration 3=15716
 polarization, migration of excitation energy, model 3=11000
 polyacenes, vitreous solid solutions, delayed, 77°K 3=20535
 polystyrene, radioluminesc. rel. to mol. wt. 3=23117
 porphyrins 3=25129
 powders, photo- and radioluminescence, duration 3=15716
 pyrene, crystals, two-photon, laser excitation 3=11002
 pyrene, delayed fluorescence 3=13212
 pyrene in 2,3 and 2,6 dimethyl naphthalene, fluorescence 3=18042
 radiationless process, rel. to high pressures 3=3059
 rare earth chelates in vinyllic hosts 3=4990
 resonance fluorescence in molecular crystals, theory 3=14215
 rigid-glass soln., photosensitized 3=959
 salicylates, far u.v. 3=21865
 slow component, meas. of decay 3=20532
 stilbene and derivs., at 98°K, u.v. and visible 3=735
 stilbene, decay of slow component 3=20532
 stilbene, polarization, rel. to migration of excitation energy 3=11000
 stilbene, scintillation decay props 3=6682
 para-terphenyl, α -particle scintillation 3=18045
 terphenyl, decay of slow component 3=20532
 terphenyl, far u.v. 3=21865
 tetraphenylbutadiene, far u.v. 3=21865
 s-tetrazine, nature of emission spectra 3=18044
 thermal activation, 35 cps. 3=958
 trans-stilbene, α -particle scintillation 3=18045
 trans-stilbene, directional anisotropy in responses 3=6680
 1, 3, 5-triaryl-2-pyrazoline, as wavelength shifters in scintillations 3=25491
 triphenylmethyl, absorption and fluoresc. spectra at 4.2°K 3=4976
 triplet exciton interactions in π -electron systems 3=25492
 triplet states, e.s.r. invest. 3=5035
 triplet states study 3=962
 tumors, malignant, spectra 3=11618
 Eu benzoylacetone chelate, 90, 300°K 3=11001
 Eu dibenzoylmethane 3=3061
 Eu chelates 3=20513
 Eu ethyl sulphate, fluoresc., transition probabs. 3=25482
 Eu, tris-dibenzoylmethide, u.v. excited 3=8628
 La ethyl sulphate, Pr-doped 3=23072
 MnCl₂ · 2C₆H₆.HCl, fluorescence lifetime and intensity 3=8613
 Na benzo-acetate, salicylate, as dosimeters, temp. var. 3=17117
 Sm benzoylacetone chelate, 90, 300°K 3=11001
 Sm dibenzoylmethane chelate, 90, 300°K 3=11001
 Tb acetylacetone chelate, 90, 300°K 3=11001
 Tb tri-anthranilate, u.v. excited 3=8628

Luminescence chambers

- Ar, liquid, response to protons, 10-50 MeV 3=19635
 Cherenkov light photograph 3=17153
 CsI:Tl scintill. with image intensifier 3=19534
 colour scheme with several liquids for spatial resolution 3=19533

Luminescence chambers—contd

- filamentary for meas. charged particle scatt., elastic, small ang. 3=17157
- filling gas, rel. to luminous output and track-forming props. 3=17152
- gas amplified, characteristics 3=17156
- image intensifier 3=17154
- image intensifier, photoelectric detection efficiency 3=19326
- paraffin, medicinal, containing PPO and POPOP 3=17104
- particle track visualization in waveguide 3=17155

Luminescent devices

- See also Counters, scintillation.
- beta-rays surface active area 3=6189
- CaSO₄(Mn) thermoluminescence dosimeter for γ -det. 3=5978
- dosimeters, thermoluminesc., phosphorescence method of reading 3=23133
- light sources, colour and efficiency 3=24005
- phase fluorimeter, construction 3=3870
- P³¹, n.m.r. in H₃PO₄, line broadening by paramag. ions 3=13316

Lutetium

- Debye temp. 3=12568
- isotopes, masses meas. 3=4727

Lutetium compounds

- LuC₂, neutron diffract. and paramag. scatt. analyses 3=1328
- LuFe garnet, square hysteresis loops 3=15868
- Lu₂O₃, Debye temp. 3=12568

Macromolecules

- See also Molecules, configuration and dimensions; Polymers; Proteins.
- adsorption of flexible macromol. 3=6892
- adsorption of flexible macromol., model 3=6893
- biological, polymerization on templates, kinetics 3=25995
- chain mols., HMO calc., exact solns. of secular eqns. 3=25157
- chain mols., law of corresponding states 3=21344
- chain, spatial location of atoms 3=12885
- chains, dimension variations, "volume effect" study 3=10555
- chains, long-distance interactions 3=4793
- chains, paramag. susceptibility 3=8445
- coiling-type, Monte Carlo study 3=15400
- coiling-type, statistical thermodynamics 3=15401
- compressibility of molecular crystals 3=15985
- desoxyribonucleic acid, Kerr const. meas. 3=4792
- DNA degradation by noncavitating ultrasound 3=20036
- DNA, transition temp. rel. to base composn. 3=22616
- dimensions of coil in laminar flow 3=21348
- electron passage, waveguide-like props. 3=8219
- enzyme action 3=23537
- excitons, accel. by elec. field, theory 3=15473
- formed by polyvinyl alcohol and Cu⁺⁺ salt reaction, dilute solutions 3=16163
- light scatt. by flowing soln., depolarization 3=14165
- light scatt. by flowing soln., interference factor 3=14164
- light scatt. by flowing soln., two-particle correl. 3=14163
- linear chain mols., non-random degradation 3=8324
- long molecules with conjugated bands, electron interactions 3=15402
- long saturated chains, London-van der Waals dispersion attraction 3=2676
- microscopic process in tearing of rubber 3=5074
- molecular wt. meas. with mag. supported ultracentrifuge 3=8942
- paraffin crystals, sublimation energy at 0°K 3=2676
- partial draining, effect on intrinsic viscosity 3=4791
- π -electron energy spectrum, conjugate bond systems 3=20035
- relaxation times, measurement by Kerr effect 3=8319
- solution, strain birefringence, theory 3=5441
- solutions, capillary and porous flow, solute velocity increase 3=113
- solutions, Kerr effect, rel. to ball-wound structure 3=4792

Macromolecules—contd

- solutions, orientation birefringence in shear flow and elec. field 3=16617
- solutions, specific vol., apparent 3=14154
- solutions, viscosity, as function of vel. gradient 3=14157
- stiff chain, rotatory diffusion consts. 3=10554
- X-ray crystallography, of biological importance, review 3=23438

Magnesium

- absorption spectrum, far u.v. 3=10956
- atomic system, continuous absorption coeff., rel. to stellar atmospheres 3=3599
- atoms, in acetylene flame, spectrum 3=23543
- atom, 2852 Å line, short-wavelength wing interpret. 3=15285
- band structure and e⁺ annihilation in 3=6503
- diffusion of Ag¹¹⁰, ion mobility, d.c., and scatt. 3=22831
- dislocation dipoles, tangles and loops 3=17732
- elastic scatt. of O⁺ ions 3=19891
- electrical resist., effect of temp. and press. 3=25323
- electrical resistivity of quenched and cold worked specimen 3=25269
- energy band structure and Fermi surface 3=781
- energy-bands, magnetic breakdown 3=20155
- fatigue behaviour in shear 3=13338
- film. diffusion of In backing and film superconductivity 3=22805
- foils, thin, dislocations, dipole, loop, prismatic 3=17751
- grain boundary cavities, nucleation 3=17773
- lattice vibr. spectrum from elastic consts. 3=10578
- Mg¹⁰⁺, 2³S state, 20-parameter calc. 3=2561
- Mg-Na vapour mixture, fluorescence 3=705
- neutron coherent scattering length 3=25708
- orthogonalized plane wave form factors 3=25229
- oxidation of single crystals and films 3=11335
- oxide film formation on crystal faces 3=23512-13
- polycrystalline, u.s. wave interaction 3=25191
- single crystals, damping meas., rel. to dislocation hysteresis 3=23306
- solar spectrum, b-line source functions 3=16369
- spark discharge, ion concn., time variation 3=2553
- spin-orbit coupling in electron band structure 3=10626
- stress relax., dislocation processes 3=23310
- thermal cycling effect on mechanical, elec. props. 3=3233
- twinning, double, mechanism 3=5079
- ultrasonic attenuation, low-temp. rel. to Bordoni peaks 3=22650
- u.s. absorption, 5-75 Mc/s, 4·2°-300°K 3=8353
- vacancies in quenched and cold worked specimen 3=25269
- X-ray emission spectra, plasmon satellites 3=8607
- X-ray emission spectrum, valence band 3=8606
- yield strength, stress direction and preferred orient. depend. 3=25628

Magnesium compounds

- acetate, in soln., dissoc. rate, from u.s. absorpt., errata 3=5439
- alloys, impurity electronic structure 3=22757
- fluorogermanate, thermoluminescence, with and without Mn 3=18053
- magnesiowustite single crystals, oxidation 3=20986
- Magnox AL80, creep props. 3=8771
- Magnox AL 80, effect of Be on exaggerated grain growth 3=25760
- Magnox AL 80 and ZR 80, fatigue behaviour at high temp. 3=25762
- Magnox ZR 55, mech. props., effect of H₂ pick-up 3=25761
- Mg ferrite, nonstoichiometric, cation distribution 3=25720
- Mg fluorogermanate, photoconductivity, rel. to u.v. irradi. 3=2978
- Mg halides, vapour, mass spectr. study 3=2673
- Mg spinel, spectral and relaxation props., rel. to Cr activation 3=20512
- Mg-Al alloys, characteristic electron-energy losses 3=6501
- MgAl₂O₄, Cr³⁺ ion e.s.r. 3=3171
- MgAl₂O₄, Cr³⁺, zero-fld splitting rel. to magnetic anisotropy 3=1012
- MgAl₂O₄, e.p.r. of Mn²⁺, Fe²⁺ 3=8711
- MgAl₂O₄ spinel, Mn²⁺ e.p.r. 3=8712
- Mg-Au films, vacuum deposition, orientation 3=20924

Magnesium compounds—contd

- Mg—Cd alloys, long-range order, Cd conc. and temp. depend. 3=23480
- Mg—Cd alloys, ordered, X-ray structural study 3=23579
- Mg—Cd, creep props. 3=8772
- MgCuCr ferrite, ferrimagnetic resonance 3=6743
- Mg(D_{0.5}H_{0.5})₂, crystal structure 3=13457
- MgF₂, films, on Al, reflectance, minimum, 17 μ , after heating in vacuo 3=9601
- MgF₂, growth of highly-perfect single crystals for masers 3=23397
- MgF₂, n.m.r. of F¹⁹, by spin echo 3=8732
- Mg—Fe, eutectic and solid solubility 3=11299
- MgFe₂O₄ crystal growth, Pb pyrophosphate as flux 3=5083
- MgFe₂O₄, remanent mag., field depend. 3=11063
- Mg fluorogermanate, photocoloration and photo-conductivity rel. to u.v. irradi. 3=25837
- Mg(G_{1-x}Mn_x)O₄, cation distrib. by X-ray dispersion, anomalous 3=13486
- Mg₂Ge, band structure eval. 3=2752
- Mg₂Ge, i.r. reflection spectrum 3=15653
- Mg₂Ge, refractive index, 7-10 μ 3=8576
- Mg₂Ge_{1-x}Si_x, thermoelectricity meas. 3=13142
- Mg₂Ge, thermal cond. rel. to temp. 3=12931
- Mg(H₂O)₆(BrO₃)₂, elastic and thermoelastic props. 3=18161
- MgI excitation in chromosphere 3=11543
- Mg—In h.c.p. alloy, local order study by X-ray scattering 3=25744
- Mg—Li ultrasonic attenuation, low-temp. rel. to Bordoni peaks 3=22650
- Mg/MgO, sintered, as nuclear material 3=15268-9
- Mg—Mn alloys dilute, mag. props., with low-temp. resistance minimum 3=4996
- Mg—Mn cores, square-loop, flux reversal 3=1084
- MgMn ferrite memory cores, high-speed switching 3=15872,
- Mg—Mn ferrite, demagnetizing energy 3=9899
- MgMn ferrite, hysteresis loops, rectangularity 3=13272
- MgMn ferrites new materials for memory cores 3=15875
- MgMn ferrites, rotational hysteresis losses 3=18101
- MgMn ferrites, new materials for memory cores 3=15875
- Mg—Mn single crystals, plastic deformation and work hardening 3=25624
- MgMn spinels, ferromag. reson. line widths, temp. and freq. depend 3=23210
- Mg—Nd alloys, effect of Nd on elec. resistivity 3=829
- Mg—Nd double nitrate, reflection spectrum 3=23063
- Mg—N, ultrasonic attenuation, low-temp. rel. to Bordoni peaks 3=22650
- MgNiF₂, mag. dipole transitions, from pleochroism 3=19993
- MgO, acoustic interaction, non-linear, 9 Gc/s, on <100> axis 3=20096
- MgO, Bordoni peaks 3=23294
- MgO, Burgers vector, electron micr. meas. 3=803
- MgO, cathodoluminescence, vacuum u.v. 3=13178
- MgO, creep, high-temp. steady-state rate 3=15998
- MgO, Cr³⁺, Mn²⁺, Fe³⁺, Fe²⁺, Ni²⁺, ultrasonic spin res. meas. 3=23240
- MgO crystal growth, Pb pyrophosphate as flux 3=5083
- MgO, damage by sliding and wear 3=11189
- MgO, dislocation damping at low freq. 3=3214
- MgO, dislocation loops after cold-working and annealing 3=25277
- MgO, dislocations and yield stress, rel. to neutron-irrad. 3=18185
- MgO, e.p.r. of Mn²⁺, additional biquadratic exchange term in spin Hamiltonian 3=20627
- MgO, e.s.r. of Cr³⁺, linear elec. shifts 3=25568
- MgO, elastic moduli, kc/s meas. 3=15971
- MgO, elec. conductivity 3=15611
- MgO, electron diffraction relativistic effect 3=1309
- MgO, electron micrographic images, mean and anomalous absorption coeffs., meas. 3=1299
- MgO, electron micrographs 3=11334
- MgO, electron wave-field absorption by interference double refraction 3=1284
- MgO emission spectrum, Mg—oxygen flame 3=10504
- MgO, e.s.r. of Fe³⁺ rel. to cryst. field 3=2695
- MgO, exoemission, luminescence 3=419

Magnesium compounds—contd

- MgO, ²⁵E state of V²⁺, strain-induced splitting 3=23108
- MgO, fatigue straining, dynamic recovery 3=20749
- MgO, F-centres, Γ_1^e and Γ_2^e state wave functions 3=25301
- MgO, grown-in dislocations, ppt. particles identified 3=10673
- MgO, i.r. absorption, calc. 3=15684
- MgO, luminescence, electron excitation 3=15717
- MgO—MnO₂—Fe₂O₃ ferrite, magnetic props. rel. to Sc₂O₃ addition 3=20613
- MgO, motion of dislocations and slip 3=5071
- MgO, neutron damage effects 3=25310
- MgO, neutron irradiated, sorption of O₂, H₂, N₂O 3=13604
- MgO, neutron irradiat., spin—lattice relaxn. of F-centres 3=817
- MgO, O¹⁷ n.m.r. 3=20682
- MgO particles, optical props. meas. 3=924
- MgO, plastic deformation, under rolling contact stresses 3=23321
- MgO, plastically deformed, dislocation distribution 3=25283
- MgO, point defects 3=22717
- MgO, secondary electron emission 3=14637
- MgO, secondary emission, substrate material effect 3=19322
- MgO, slip bands, and microhardness rel. to irradi. 3=17761
- MgO, slip and fracture 3=6802
- MgO, spin—lattice relax. of Mn²⁺ 3=8724
- MgO surface, for reflectance standard 0.3-2.6 μ 3=1786
- MgO, tensile strength increase by dislocation introduction 3=25639
- MgO, thermodynamic props. 298°-1200°K 3=25196
- MgO, u.s. velocity near resonant absorption, by u.s. e.s.r. 3=6759
- MgO·Al₂O₃ crystals, transition metal impurity ion energy spectrum calc. 3=20130
- Mg(OH)₂, lattice energy levels by neutron scatt. 3=17643
- Mg₂Pb, semiconducting props., p-type 3=10834
- MgSO₄, aqueous soln., sound absorp., relax.theory 3=23879
- MgSO₄·H₂O, crystal structure 3=18327
- MgSO₄·7H₂O, u.s. velocities, elastic consts., and structure 3=20690
- Mg₂Si, i.r. reflection spectrum 3=15653
- Mg₂Si, refractive index, 7-10 μ 3=8576
- Mg₂Si, thermal cond. rel. to temp. 3=12931
- Mg₂Sn, band structure eval. 3=2752
- Mg₂Sn, elec. props. 3=2922
- Mg₂Sn, i.r. reflection spectrum 3=15653
- Mg₂Sn, refractive index, 7-10 μ 3=8576
- Mg₂Sn_{1-x}Pb_x, energy-gap variation rel. to composition 3=869
- MgTiO₃, dielec. props., microwave freqs. 3=13112
- MgTiO₃, e.s.r. of Cr³⁺ at 24 and 35 kMc/s 3=15938
- MgWO₄, e.s.r. of Cr³⁺ 3=15939
- MgZn ferrite, neutron diffraction study 3=23184
- Mg—1/2 wt.% Zr alloy, grain boundary denuded zones 3=16116
- Mg—Zr alloy ZA, creep at 400° and 450°C in CO₂ 3=25629
- Mg—Zr, heat treatment in H₂ creep ductility improvement 3=25763
- Magnetic cooling**
- antiferromagnetism, by adiabatic magnetization 3=15909
- magnetothermal devices, bound to figure of merit 3=358
- MnBr₂·4H₂O, by adiabatic magnetization 3=15907
- n.m.r. in demagnetized state 3=6760
- Magnetic devices**
- circuits, alternating, complex quantities 3=9909
- computer memories, review 3=14729
- conference, Philadelphia (1963) 3=14465
- current monitor for particle beams 3=446
- de Haas—van Alphen effect, sample orienting device, for low-temp. and high mag. fields 3=19413
- ferrite core memories in spark chambers 3=10009
- ferrite, memory cores, multipath, flux switching 3=15870
- ferrite memory cores, nondestructive readout 3=15871
- ferrite power limiters, frequency range 3=15882
- ferrites, for microwaves 3=24475
- ferrites memory cores, history, effect on switching 3=15869

Magnetic devices — contd

- ferromagnetic amplifier, parallel-pumped 3=490
- field inhomogeneities reduction in n.m.r. expts. 3=7727
- film memories, drive current margins 3=14730
- lens, long, focusing properties, Monte Carlo method 3=19342
- magneto-optical readout for magnetized oxides 3=14735
- magnetostrictor, vibrating, dissipative forces 3=19411
- memory read-only device, thick-film 3=14733
- memory wires, "distrib" thresholds 3=15849
- modulators of even harmonic type, theory 3=4247
- modulators of even harmonic type, theory 3=17029
- particle accel., linear, 1 GeV, beam extraction, three magnets 3=16997
- quantum magnetic dipoles, neutral, containment, toroidal 3=15271
- servo magnetic balance 3=19412
- shock tube, with variable field. 3=202
- solenoid, one-coil, field intensity and deformation, rel. to material 3=19414
- storage media, noise analysis 3=17030
- suspension method for low-temp. work 3=2087
- thermal switch, superconducting, anisotropic 3=16882
- thin film computer store, interaction with control current pulse 3=19415
- thin film matrices, parameters meas. 3=4248
- transmission delay line, using Permalloy film 3=14732
- waffle iron memory structure 3=14731
- MgMn ferrite memory cores, high speed-switching 3=15872
- MgMn ferrites, new materials for memory cores 3=15875
- Ni-Fe-Co film, memory devices, effect of skew 3=14734
- Ni ferrite, memory core, switching properties 3=15874
- YFe ferrite, "window frame," rotational switching 3=15873

Magnetic domains

See Magnetization state.

Magnetic field measurement

- anisotropy field in films, by ΔR effect 3=21926
- bibliographical review 3=9906
- using c.r.o. 3=2077
- in cyclotron, Berkeley 88 in. 3=5750
- in cyclotron, Colorado 52 in. 3=5749
- by e.s.r., low fields, for teaching 3=5807
- e.s.r. magnetometer, time-varying fields 3=4279
- electron spin resonance method 3=2080
- film, pulsed 3=24426
- films, anisotropy fields, secondary effects 3=4240
- gradient meas., using proton free-precession 3=7671
- Hall cell meas., edge effects in magnet gaps 3=14715
- Hall magnetometer, for 2-15.5 kG flds. 3=5806
- Hall transducer appl. 3=14716
- high flds, by n.m.r. 3=5808
- induction-coil method 3=21922
- low-intensity fields, using Ni-Fe films 3=14722
- at low temperatures, high fields 3=5805
- by magnet giving equal field 3=17024
- magnetic resonance methods, review 3=5031
- magnetometer, torsion, for ferromag. films 3=24424
- magnetometer, vibration excitation 3=17021
- magnetoresistance probe for small space 3=14721
- Ni, stray fields above Bloch walls 3=19402
- nonuniform, use of ferroprobes 3=19401
- null indicator using ferromag. film instability 3=24425
- in plasma, multi-coil probe 3=16954
- plasmas, using Zeeman effect 3=16955
- point-by-point, use of Hall effect 3=12283
- paramagnetic resonance used for meas. in v. small volumes 3=25519
- probe in plasma, error evaluation 3=9804
- proton magnetometer, effect of rotation 3=465
- satellite, review 3=25937
- Sn-Pb supercond. detector 3=468
- stray fields above specimen 3=13266
- in sunspots 3=11538
- superconducting coils, low fields, probe sensitivity 3=21923
- surface microfields, electron-optical method 3=3373

Magnetic field measurement—contd

- surface microfields on ferromagnetics, electron mic. meas. 3=2075
- weak, by n.m.r. of liquids 3=21420

Magnetic fields

See also Electromagnetic fields; Interplanetary magnetic fields.

- amplification, during plasma confinement 3=12173
 - axially symmetric, for image tube systems 3=4244
 - axisymmetric, magnetic flux function 3=12290
 - betatron with H-type magnet, field inhomogeneities 3=766
 - boundary with plasma, location, correction 3=16307
 - channel for charged particles, transfer matrix 3=14670
 - conductor embedded in Fe frame of inf. perm. 3=7674
 - control, using c.r.o. 3=2077
 - cylindrical conducting slotted shell, helical field 3=5811
 - current, cylindrical system, sine analogy with plane condenser potential 3=19162
 - current systems, calc. by elliptic integrals 3=21939
 - diffusion into conductor, with moving boundary condition 3=17025
 - electrodeless discharge, pulsed, topography 3=14542
 - ferromagnetic material, alongside a concave aperture, after passage of a current, calc. 3=21927
 - field establishment, effect of inclusions 3=2083
 - force-free, stability, appl. to spiral galaxies 3=5825
 - formation by current in multilayer medium 3=14725
 - Galaxy 3=11583
 - general force expression for arb. \vec{B} and \vec{H} 3=9898
 - generation by various types of magnets, review 3=21930
 - helical, mag. surfaces, effect of perturbs. 3=5812
 - helical, props. of magnetic "surfaces" 3=14724
 - Heliotron B, spatial confinement of plasma 3=1990
 - inhomogeneities, in n.m.r. expts., reduction 3=7727
 - in intergalactic space 3=5283
 - ionosphere, F-region, from $h' - f$ records 3=1466
 - magnetic surfaces of periodic fields, proof 3=7676
 - magnetostatic dipole moving to conducting half space 3=5811
 - moon 3=5237
 - neutral line, liquid instability, energy transform. 3=5826
 - nuclear instruments, weak and strong focusing, parameters 3=19598
 - on particle near cylinder in homog. mag. field 3=19406
 - plasma, hydrodynamic excit. in temp. gradient 3=21843
 - plasma, spatial amplification in magnetoacoustic resonance 3=7544
 - production of strong fields, review 3=24428
 - pulse, 480 kOe, production at low temps. 3=17026
 - solenoid, one-coil, intensity amplitude rel. to material 3=19414
 - solenoids, superconducting, fluctuations 3=1889
 - spiral ridge, particle motions 3=4225
 - stabilization, control by supercond. solenoids 3=14723
 - stabilizer, proton-resonance 3=19404
 - stellar, toroidal, thermal generation 3=3585
 - stratified conductor, surface, in plane e.m. waves 3=4243
 - strong pulses, prod. in small region 3=4245
 - sunspots intensity and orientation, from Zeeman effect, Fe I, $\lambda 6302$ 3=18628
 - In superconducting cylinder, penetration, rel. to ohmic dissipation 3=24144
 - sweeping about stabilized mean value 3=19405
 - topology, due to surface currents in toroidal region 3=7675
 - toroidal helical, mag. surface 3=24427
- effects**
- a.c. field on pendulum with ferromag. suspension 3=19403
 - arcs, elec., a.c. reignition in transverse field 3=4079
 - beams, ion and electron, neutralized, mag. barrier penetration, calc. 3=19423
 - charged particle motion in varying field 3=4252
 - charged-particle resonance acceleration in modulated field, theory 3=474
 - convection 3=21585
 - crystals isolated at low temp., temp. oscillations 3=2743
 - on dielec. const. of anisaldazine liquid crystal 3=11803
 - discharge, electric, thread 3=7468
 - elastic modulus of ferromag. metal, 60 c/s field 3=15970

Magnetic fields — contd

effects — contd

- elec. discharges, spectroscopic "slant" effect, theory 3=19200
- electron in periodic lattice, approx. calc. 3=2751
- electron scatt. by mag. field in impenetrable torus 3=19422
- electrophoresis, CuSO_4 , petrol, vaseline, ink 3=16901
- F-centres, paramagnetic relaxation 3=17797
- Faraday rotation in atomic spin system, theory 3=22489
- ferrite, pulsed, e.m. wave radiation, 8 kMc/s 3=24463
- ferromag. films, domain boundaries 3=20594
- ferromagnetic materials, n.m.r. 3=23257
- Galaxy 3=9282
- gamma-ray beams, polarized, modulation 3=24681
- γ -rays, 14 keV, from Fe^{57} , permanent magnet's field, search for effect 3=2132
- gases, charged particle motion in alternating fields 3=387
- initial response of spectrum of isotropic turbulence 3=21952
- Kramers salts, thermal resistance 3=12933
- magnetic moments calc., from vertical component 3=2086
- magnetization increase in high fields 3=6706
- masers, optical, $\text{CaF}_2:\text{Tm}^{3+}$, Zeeman tuning 3=9975
- masers, optical, gas, output, var. r.f. excitation 3=24510
- maser, optical, Zeeman tuning, He—Xe, 2.026 μ 3=17076
- metals, effect of mag. field appl. 3=15432
- metals, long-wavelength phonon energies 3=4808
- momentum transfer, ion—neutral particle, weakly ionized gas 3=21718
- nuclear decay, ang. correl., dipole interact. 3=8025
- n.m.r., free, inhomogeneity 3=21994
- p—n junctions, photomagnetic effect 3=10846
- plasma beam, ion and electron, neutralized, mag. barrier penetration, calc. 3=19423
- plasma, cold, 1-dimensional motion 3=12101
- plasma column, equilibrium 3=7532
- plasma confinement, effect of errors 3=9801
- plasma confinement, turbulence 3=9802
- plasma, diffusion, effect of "drift" waves 3=24322
- plasma, diffusion of charged particles 3=21790
- plasma, electron and photon relax. 3=22107
- plasma, "gun", calc. 3=9808
- plasma, kinetic eqn. in strong field 3=5665
- plasma, kinetic eqn. in weak static field 3=5664
- plasma oscillations, dispersion relations, calc. 3=19292
- plasma, passage round 90° bend in field 3=19267
- plasma sphere, e.m. resonances 3=7537
- plasma stopping power for fast charged particle 3=12103
- plasma stream, solenoidal field 3=24288
- plasma, strong 3=21769
- positive column, diffusion 3=14554
- pulsed, 200–100kG, on spark chamber efficiency 3=7751
- on Rayleigh—Taylor instability 3=9914
- scattering, light, polar molecule meas. possibility 3=24059
- semiconducting transistors, collector transition capacity c—e voltage 3=20364
- semiconductors, electron temp. fluctuations and noise 3=17835
- "silicon steel", domain structure rel. to alternating field 3=11069
- sphere suspension, torques and Coriolis effects 3=21929
- in stars, elements, relative abundance, surface 3=11564
- steel, molten, removal of nonmetallic occlusions by heavy elec. current 3=20912
- steel, Type E310, heat treatment, mag., effect of field on hysteresis and mag. curve 3=20584
- superconducting sphere, transient effects 3=16865
- superconducting tunnelling, 3-terminal superconductor—insulator—metal device 3=24151
- superconductor, Pb, noise, Barkhausen type 3=24147
- superconductors, second-type 3=5577
- supersonic sound, dispersion and absorption 3=3853
- u.s. vel., oscill. changes with var. mag. field, Bi, 4° K 3=8402
- Am^{241} , α — γ ang. correl. 3=6211
- Ar plasma, deionization 3=19249
- Ar pulsed discharge, light characteristics 3=14540
- Bi, i.r. magnetoabsorption, interband transitions 3=8592
- Bi—Sb alloys, magneto-Seebeck effect 3=10896
- Bi—Sb alloys, on thermoelec. props., 78°–295° K 3=4958

Magnetic fields — contd

effects — contd

- Cs diode, electronic s.c. current 3=19166
- D^- ion, 20 MeV, electron detachment 3=24213
- Dy^{3+} , electronic structure 3=8377
- Er^{3+} , electronic structure 3=8377
- Fe whiskers growth 3=13422
- GaAs diodes, maser, electroluminescence, 90 kG 3=20542
- GaAs, semiconducting props. 3=25364
- Ge, low-temp. breakdown highly-compensated p-type 3=20310
- Ge, magneto-Seebeck study in n-type, quantum transport 3=4914
- Ge magnetodiode, carrier distribution 3=17909
- Ge, n-type, elec. cond. variation in strong pulsating flds. 3=2887
- Ge, photoconductivity, negative, > 10 kOe 3=17958
- Ge photodiode current 3=20408
- Ge, surface conductance 3=13059
- H, ionization, collisional breakup 3=19176
- H_2 , electron collision freq. 3=21701
- He discharge, effect on e.m. radiation, 35 and 10 kMc/s 3=4031
- Hg arc, low-press., limiting current, azim. mag. field effect 3=4068
- Ho^{3+} , electronic structure 3=8378
- Kr plasma, locally applied 3=12116
- Mg energy-bands, magnetic breakdown 3=20155
- Nb_3Sn superconducting hollow cylinder, pulsed, up to 8.2 kG 3=19116
- Ni, superconducting, surface electrical losses, in l.f. fields 3=12033
- Ni—Cu alloys, thermoelectric power variation 3=20427
- Pb, superconducting, surface electrical losses, in l.f. fields 3=12033
- Sb, de Haas—van Alphen oscill. 3=4818
- Sb, u.s. attenuation, geometric resonance 3=4817
- Yb^{3+} , electronic structure 3=8379
- YFe garnet, ferromagnetic resonance, rel. to r.f. field 3=8701

Magnetic hysteresis.

See Magnetization process.

Magnetic measurement

- See also Magnetic field measurement. Entries describing measurement methods for specific magnetic quantities and effects may also be found listed under the various headings for the subjects concerned.
- adiabatic demagnetization, susceptibility, meas., by recording fluxmeter 3=14709
- anisotropy, induced, in thin films 3=15847
- antiferromagnetic domains, visual obs. using gyrotropic birefringence 3=14713
- automatic, using analogue digital converters 3=9907
- balance for automatic susceptibility meas. 3=21924
- balance to meas. susceptibility of para- and ferromagnets 3=24422
- balances, noise reduction in amplifier circuit 3=5608
- ballistic meas. coils, mag. correction factor 3=9900
- compensation of earth's mag. field 3=19399
- cryostat for susceptibility meas., 4.3° to 300° K 3=2078
- Curie point meas. using a.c. permeability 3=23152
- domain studies, contrast in magneto-optic apparatus 3=14712
- dynamic, hysteresis, by damped oscill. fields 3=5804
- electromagnetic, precision, conference, Boulder, Aug. 1962 3=9689
- Faraday rotation, microwave, using bimodal cavity 3=12316
- Fe, small crystal, magnetizing field by electron diffraction 3=19396
- ferrites, susceptibility tensor 3=20612
- ferromagnetic films, anisotropy 3=12284
- ferromagnetic films, by balance, automatic torque, sensitive 3=14707
- ferromagnetic films, hysteresis loops 3=24424
- ferromagnetic, hysteresis loop by Kerr effect 3=9904
- ferromag. powders, anisotropy distrib. detm. 3=1092
- ferromagnetic rotl. hysteresis 3=4239
- ferromagnetic thin films, magnetization curves 3=8674
- films, high-speed magnetization reversal, direct obs. method 3=14711
- films, solid, mag. analysis by electron diffraction 3=5014

Magnetic measurement—contd

- flux changes, precision method 3=14710
- fluxmeter, high-sensitivity, rotating commutator 3=2076
- Gouy apparatus for temp. range 77°-350°K 3=14717
- gyromagnetic ratio, magnetomechanical detm. 3=467
- induction, with ballistic galvanometer 3=17018
- induction in high mag. fields at low temp. 3=6689
- liquids, susceptibilities, Quincke method 3=17016
- lunar surface and subsurface susceptibility 3=13856
- mag. phase transitions, by miniature coil, pulsed-field techniques 3=17022
- magnetogram reader, semiautomatic 3=11463
- magnetometer for rock magnetism 3=9905
- magnetometers, rocket-borne 3=21140
- magnetoresistance of ferromag. films, rotating mag. field technique 3=14470
- magnetostriction, under high hydrostat. pressure 3=1150
- magnetothermal, analysis, review 3=466
- Ni films, magnetization in ultra-high vacuum 3=17020
- paramagnetic cpds. in soln., susceptibility 3=4242
- particles ~ 1 μ , torsion balance 3=7672
- permeability complex, with Q meter permeability 3=14471
- permeability determination, at low frequency, with non-resonant cavity, possibility 3=7673
- permeability, reversible, 50 kc/s to 3 Gc/s 3=24423
- permeameter, for permanent magnets 3=14719
- permeameter, r.f., basic equations 3=14720
- piezo-susceptibility, inductance potentiometer 3=12288
- plate parameters, eddy current method 3=9902
- principal susceptibilities of triclinic crystals 3=17019
- remanence, particles near single-domain size 3=19400
- rock sample, astatic magnetometer 3=12287
- rocks, remanent moment, temp. var. meas. 3=14708
- separation for paramag. powders analysis 3=9903
- servo magnetic balance 3=19412
- susceptibilities of small samples, Gouy and Thorpe-Sentfle methods 3=12286
- susceptibility, by ponderomotive method, for anisotropic crystals 3=5809
- susceptibility, of semiconductors, modified Gouy method 3=21925
- susceptibility, total and anisotropic, of rocks 3=14718
- susceptibility, using n.m.r. technique 3=4241
- susceptibility, in weak low-freq. fields 3=12289
- thin film matrices, parameters meas. 3=4248
- torsion balance for anisotropy, magnetization meas. 3=19397
- triclinic crystals, susceptibilities 3=12285
- torsion scales, problems of operation 3=2079
- uniform dephasing, applied to thin mag. films 3=9901
- vector mag. at temps., instrument 3=464

Magnetic properties of substances

- alloys, form factors of mag. impurities 3=8380
- alloys, liquid, susceptibility 3=3816
- alloys, rel. to elastic stress 3=8634
- anthracene coal, susceptibility 600°-1200°C 3=11023
- condensed systems, at low temp, papers in conference, Kiev, 1961 3=24124
- conference, Pittsburgh (1962) 3=13222
- crystals, magnetic symmetry 3=25497
- crystals, monoclinic orthorhombic, susceptibilities, calc. 3=15728
- electron-nucleus interact. in mag. crystals 3=15732
- ferrite, internal mag. field at Co nuclei 3=1154
- ferrites, in decreasing alternating fields, hysteresis 3=8692
- ferrites, rare earth, three magnetic sublattices, normal energy state 3=6720
- film, superconducting, mag. moments 3=6688
- films, differential susceptibility 3=23170
- gyromagnetic materials, intrinsic and external permeabilities and susceptibilities 3=25498
- In Heusler alloy, Curie temp. change by hydrostatic pres. 3=11026
- ionic compounds, various, magnetic interactions 3=15741
- liquids, relax rate, molecular shape effects 3=5449
- metallic layers, conference, Liège (1961) 3=13029
- metals and alloys, susceptibilities, density matrix theory 3=22700

Magnetic properties of substances — contd

- metals of high purity 3=15531
- metals, spin disorder, review 3=10715
- nitro group, mag. anisotropy study 3=12856
- rare-earth ions in cubic environment, theory 3=2749
- rare-earth metals, mag. order 3=8380
- rare-earth metals, neutron diffraction investig. 3=1107
- rocks, equiv. cct determ. 3=19135
- semiconducting sphalerite-type structures, susceptibility rel. to chemical binding 3=20549
- semiconductors, lattice mag. susceptibility 3=11022
- spinel, anisotropy, cation contrib. to lattice distortion 3=1012
- spinel, Jahn-Teller distortion 3=1009
- susceptibility, high-temp., interpretation 3=990
- transition-metal solid solutions, rel. to superconductivity 3=15747
- water, mag. susceptibility, protons contrib. 3=23907
- Al, superconducting, irreversible behaviour, rel. to lattice defects 3=19104
- Al_{0.89}Mn_{1.11}, mn mag. moments 3=25737
- Au₄Mn, Curie temp. change by hydrostatic pres. 3=11026
- B elements, liquid, electron theories 3=9480
- B-H charact., coercivity rel. to driving field 3=23157
- BaFe₁₂O₁₈, magnetic anisotropy, effect of F-compensated Co²⁺ 3=15877
- BaTiO₃, Co addition effects, -80 to +120°C 3=22996
- CoSO₄, spin config. coupling by anisotropy 3=3091
- CoSO₄·7H₂O, induction in high fields at low temp. 3=6689
- Co uranate mag. structure 3=3320
- Cr, band electrons, spiral spin polarization 3=8646-7
- Cr³⁺ ions in crystals, molecular orbital theory 3=13163
- Cr₂O₃, magnetization induced by elec. field 3=15740
- Cr₂O₃, magnetization induced by elec. field (magnetoelectric effect") 3=15739
- (Cr₂O₃)_{0.8}(Al₂O₃)_{0.2}, magnetization induced by elec. field 3=15740
- Cu²⁺, mag. anisotropy, susceptibility 3=13224
- Cu acetate monohydrate, isotropic exchange integral 3=15730
- Cu-Co alloy, uniaxial anisotropy after annealing 3=13232
- Cu-Co alloys, down to 0.01°K 3=8635
- Cu complexes at low-temp. 3=1060
- CuFe₂S₃, rel. to polymorphic transition 3=11049
- Cu hydrated formates, low temp. 3=18056
- Cu salicylate, crystal modifications, mag. different 3=23374
- Dy, temp. depend. 3=5017
- Dy-Y solid solutions variation with temp. and composition 3=15745
- Er₂O₃, neutron scatt., energy distrib. 3=743
- Eu divalent compounds 3=15743
- Fe-Al alloys, internal mag. fields and saturation magnetization 3=15734
- Fe-Al solid solns., ordering, mag. interact. 3=6871
- Fe-Co alloys, mag. moment distrib. 3=18098
- Fe-Rh system, hyperfine fields and mag. moments 3=15733
- Fe₇S₈, magnetocrystalline anisotropy 3=1025
- FeSi, neutron diffn. search for antiferromag. props. 3=25543
- Ga, temp. depend. 3=5017
- Ga_{2-x}Fe_xO₃, 4-350°K props. 3=15777
- Ge- α -Fe solid solution 3=3340
- H₂O₃, neutron scatt., energy distrib. 3=743
- He³, liquid, nuclear susceptibility under pressure 3=1882
- Ho, mag. structure detm. by neutron diffraction 3=1108
- HoCo₃, mag. structure 3=6682
- K (Mn, Co, Ni) F₃, superexchange interaction 3=25553
- KNiF₃, molec. orbital analysis 3=936
- K₂NiF₄ structure, 4°K upwards 3=11024
- La₂Co(NO₃)₁₂·24H₂O, susceptibility, rel. to crystal structure 3=8867
- LiH molecule, magnetic susceptibility and shielding 3=8260
- Mg-Mn alloys, dilute, with low-temp. resistance minimum 3=4996
- Mg-Mn ferrite, demagnetizing energy 3=9899

Magnetic properties of substances — contd

- MgZn ferrite, neutron diffraction study 3=23184
- Mn hydrated formates, low temp. 3=18056
- MnP, metamagnetic state (below 50°K) 3=15735
- MnS, susceptibility, rel. to oxygen impurities 3=25554
- Mn₂Sb, anisotropy energy rel. to temp. 3=1129
- MnSb—CrSb system, magnetic structure 3=8698
- Mn uranate mag. structure 3=3320
- NaF, M- centres, paramagnetism question 3=819
- Nb, superconductivity persistent currents, effects 3=3951-2
- Nb—Zr, superconducting persistent currents, effects 3=3951-2
- Ni arsenides, atomic moments and magnetic coupling 3=15738
- NiFe₂₋₃V₃O₄ spinel, sat. magnetization and susceptibility rel. to temp. 3=1008
- Pb-base superconducting alloys 3=9684
- Pd, absence of antiferromagnetism 3=15913
- Pd, role of hydrogen atoms 3=25749
- Pd—Fe alloys, atomic magnetic moment 3=15737
- Pd—transition metals, mag. interactions 3=3078
- PrH (x = 2.02-2.75), variation with temp. 3=15744
- PuD₂^x, ferro- or ferrimag. props. 3=15783
- PuH₂^x, ferro- or ferrimag. props. 3=15783
- Pu nitrides and sulphides 3=16473
- Sc, susceptibility, 100° to 1000°K 3=25508
- SmH (x = 1.99-2.68), variation with temp. 3=15744
- Sn, film, supercond; mag. moment 3=6687
- Tb, ferro and antiferromag. props. 3=15742
- Tb₂O₃, neutron scatt., energy distrib. 3=743
- Th nitrides and sulphides 3=16473
- Tm, mag. structure detm. by neutron diffraction 3=1108
- UAl₂, susceptibility 3=8730
- UD₃ and UH₃, β-modification, susceptibility 3=6692
- U nitrides and sulphides 3=16473
- XNi₂ (X = yttrium or lanthanide), magnetic props. of Laves phases 3=15746
- YCo, mag. structure 3=8682
- Y—Eu garnets, mag., crystal props. 3=3124
- YNd garnet, magnetization curves and structure 3=23183

antiferromagnetic

See also Antiferromagnetism.

- NiO, electron diff. scatt., polarized 3=18111

antiferromagnetic

See also Antiferromagnetism.

- crystals, Raman spectra, observation possibility 3=8588
- cubic lattice, mol. field calc. of Néel temp. 3=3134
- αα-diphenyl-β-picrylhydrazyl, free radical in crystal 3=18117
- garnets, review of Russian work 3=3092
- metal—insulator transition 3=10729
- molecular chains, interaction rel. to no. of links 3=6445
- olivines, synthetic 3=23142
- rare earth cpds (RAl₂-type) spin moments, coupling 3=991
- rare earth cpds. with group V anions 3=20609
- relaxation time, in paramag. range 3=13265
- spinel, vanadium, rel. to interatomic distance 3=12934
- susceptibilities due to interstitials, holes 3=15904
- Au₃Mn, antiferromag.—ferromag. spatially inhom. state 3=1003
- Au₃Mn, Néel and Curie temps., Bohr magneton, magnetization 3=1004
- BiFeO₃ 3=3147
- BiFeO₃, magnetic ordering, by neutron diffraction, 20 and 600° C 3=5018
- CaCO₃, transition, rel. to specific heat, 1.6° to 70°K 3=17659
- CoCO₃, transition, rel. to specific heat, 1.6° to 70°K 3=17659
- CoCl₂ 3=20626
- CoCl₂, ordering in layer structure 3=20625
- CoCl₂, spin waves, semicontinuum model 3=13286
- Co—Cu dilute alloys, antiferromag. term 3=5028
- CoF₂, ordering, effect on i.r. absorption 3=15673
- CoO, effect on elasticity, temp. var. 3=6774
- CoO, magnetostriction 3=1016
- CoRh₂O₄ 3=23196
- βCoSO₄, mag. structure 3=8695

Magnetic properties of substances — contd

antiferromagnetic — contd

- β-CoSO₄, magnetic structure and mag. moment 3=15731
- Co—Tutton salt 3=1058
- CoUO₄, structure at low temps. 3=3139
- Cr, ground-state, as spin density wave state 3=2772
- Cr, neutron diff. exam. 3=23195
- Cr, neutron diffraction study 3=1109
- Cr, rel. to thermoelectric power anomaly 3=13140
- CrBr₃, 16.8-37.7°K, princ. magnetiz. 3=3140
- CrCl₃, ordering, entropy changes 3=1061
- CrCl₃, 16.8-37.7°K, princ. magnetiz. 3=3140
- CrCl₃, sublattice mag., low-temp., theory 3=25552
- Cr₂O₃, effect on elasticity, temp. var. 3=6774
- Cr₂O₃ fine grains, superantiferromagnetism 3=1093
- Cr₂O₃ fine grains, suscept. rel. to diam., 20 to 400 A 3=1094
- Cr₂O₃ fine particles 3=8697
- Cr₂O₃, fine particles 20-400 A diam. 3=3137
- Cr₂O₃ grains, anisotropy energies 3=15905
- Cr₂O₃—Fe₂O₃, mag. structure, neutron diff. meas. 3=13267
- CrPt, mag. spin distribution 3=15860
- Cr₃Se₄, mag. structure 3=3320
- CuCl₂, ordering, entropy changes 3=1061
- CuCl₂.2H₂O, Cl n.m.r., 1.3-4.24°K 3=20680
- CuCl₂.2H₂O, short-range order effect 3=18108
- Cu—Co alloys, dilute, down to 0.08°K 3=3132
- CuF₂.2H₂O, short-range order effect 3=18108
- CuFeS₂, mag. torque, powder susceptibility, Néel temp, direction 3=1027
- Cu(HCO₂)₂.4H₂O, 1.4°-80°K meas. 3=15780
- Cu—(22.8%)Mn, magnetization and magnetocaloric effect 3=8694
- Cu—Mn, polycryst., over certain range 3=4997
- CuO fine particles, susceptibility meas. 3=1095
- CuO mag. struct., by neutron diffraction 3=126
- Cu quinone complex salts, low temps. 3=11103
- Dy, ferromagnetic transform., at low temps., exchange interaction mechanism 3=20573
- DyMn₂, Laves-phase, various props. 3=15910
- Er, spiral structure model 3=3075
- EuTe 3=11038
- EuTe, at high fields and low temps. 3=11050
- EuTe, at low temps. 3=1140
- FeCO₃, transition, rel. to specific heat, 1.6° to 70°K 3=17659
- Fe—Co alloys, γ-phase 3=3146
- Fe cpds., by Mössbauer effect 3=995
- FeF₂, anisotropy energy calc. 3=8658
- Fe—Ge, saturation moment rel. to composition 3=1005
- Fe—Mn alloys, suscept. rel. to temp. 3=6733
- Fe—Ni alloys, temp. behaviour 3=6734
- Fe—Ni—Mn alloys, disordered, long-range 3=13284
- Fe₂O₃, α-phase, fine particles 20-400 A diam. 3=3137
- Fe₂O₃, α-phase, transformations 3=5029
- Fe₂O₃ fine particles 3=8697
- α-Fe₂O₃ fine grains, superantiferromagnetism 3=1093
- α-Fe₂O₃ fine grains, suscept. rel. to diam., 20 to 400 A 3=1094
- α-Fe₂O₃ fine particles, susceptibility meas. 3=1095
- α-Fe₂O₃, natural and synthetic 3=1019
- FeP₂ 3=1018
- Fe—Pt alloys, γ-phase 3=3146
- Fe_{0.999}S, high- and low-temp. arrangements by neutron diffraction 3=1023
- FeS_{1.005}1.05, 1.07, easy axis direction 3=2698
- FeSi, neutron diffn. search for antiferromag. props. 3=25543
- Fe—Sn, saturation moment rel. to composition 3=1005
- FeSn₂, neutron diffraction study 3=1111
- (1-x)FeTiO₃—xFe₂O₃, 2nd nearest neighbour Fe-layer interact. 3=1022
- Gd, f—conduction electron spin coupling 3=8400
- Gd, helical antiferromagnetism 3=6732
- Gd—Co alloys, spin arrangements rel. to comp. 3=1000
- Gd—Fe alloys, spin arrangements rel. to comp. 3=1000
- GdMn₂, Laves-phase, various props. 3=15910
- Ge, n-type, heavily doped, transformation 3=23135
- HoCo₃, magnetic structure and mag. moment 3=15731
- HoD₂, magnetic structure 3=15911

Magnetic properties of substances — contd**antiferromagnetic — contd**

- HoMn₂, Laves-phase, various props. 3=15910
 KCuCl₃ 3=18314
 KMnF₃, transition, 84.3°K, and specific heat 3=8365
 KNiF₃, rel. to optical spectra 3=12892
 K₂NiF₆, structure by neutron diffr. 3=3138
 LaCrO₃ 3=3147
 La₂NiO₄ 3=18107
 LiMnPO₄, Mn—O—P—O—Mn superexchange 3=18151
 Mn alloys, interactions 3=1001
 MnAu₃, ferromagnetic transform., at low temps, exchange interaction mechanism 3=20573
 MnAu₃, magnetization in pulsating fields, temp. depend. 3=3136
 MnAu₃, transformation, threshold field magnitude and temp. rel. to pressure 3=18116
 MnCO₃, magnetic spec. heat 3=3145
 MnCl₂, liq. He temps., rel. to specific heat 3=2731
 Mn_{2-x}Cr_xSb, x = 0.023–0.10, structure 3=23197
 Mn_{2-x}Cr_xSb, X-ray and mag. studies 3=13282
 MnF₂, effect of cooling 3=3143
 MnF₂, lattice thermal cond. below Néel temp. 3=25212
 MnF₂, nuclear spin–lattice relax., calc. 3=18137
 MnF₂, rel. to optical absorption bandwidth 3=25461
 MnF₂, susceptibility, 1°–45°K 3=18115
 Mn–Ge, saturation moment rel. to composition 3=1005
 MnO, additional biquadratic exchange term in spin Hamiltonian 3=20627
 MnO, effect on elasticity, temp. var. 3=6774
 MnO fine grains, superantiferromagnetism 3=1093
 MnO, susceptibility rel. to temp. 3=1015
 MnRh ordered alloy, 170–4°K range 3=15752
 Mn–Sn, saturation moment rel. to composition 3=1005
 Mn telluride, susceptibility, structure 3=11104
 Mn–Tutton salt 3=1058
 MnUO₄, structure at low temps. 3=3139
 Mo, absence, by neutron diffraction study 3=3141
 Nd₂NiO₄ 3=18107
 NiCO₃ 3=1115
 NiCO₃, transition, rel. to specific heat, 1.6° to 70°K 3=17659
 NiCl₂ 3=20626
 NiCl₂, ordering in layer structure 3=20625
 NiCl₂, spin waves, semicontinuum model 3=13286
 NiF₂, spin wave enhancement in domain walls 3=18114
 NiFe_{2-x}V_xO₄ spinel, sat. magnetization and susceptibility rel. to temp. 3=1008
 Ni₃Mn and ordering temp. 3=20623
 Ni₃Mn, exchange interaction, magnetization temp. depend. 3=20583
 NiO, domain structure, birefringence obs. 3=18109
 NiO, domain walls, twin structure 3=15912
 NiO, electron diffraction exam. 3=3135
 NiO fine grains, superantiferromagnetism 3=1093
 NiO fine grains, suscept. rel. to diam., 20 to 400 Å 3=1094
 NiO fine particles 3=8697
 NiO fine particles, susceptibility meas. 3=1095
 NiO, fine particles 20–400 Å diam. 3=3137
 NiO, mag. structure, neutron diffrn. study 3=3289
 NiO, magnetostriction 3=1016
 NiO, structure, electron diffr. study 3=1157
 NiO, T-domain walls, electron microscope obs. 3=20622
 NiRh₂O₄ 3=23196
 NiTiO₃ 3=15906
 Pb(Fe_{1/2}Nb_{1/2})O₃, rel. to ferroelec. props. 3=6615
 Pb(Fe_{2/3}W_{1/3})O₃, rel. to ferroelec. props. 3=6615
 Pd₃Mn, antiphase domain structure, by neutron diffr. 3=6729
 Pt–Fe alloys, mag. structure rel. to chem. order 3=8696
 Pt₃Fe, unit cell changes at transition 3=25745
 RbMnF₂, large exchange interaction and small anisotropy 3=3144
 Rh–Fe mag. structure 3=3320
 Sm, at ν 0.15°K 3=2468
 Tb, neutron diffraction study 3=1108
 Tb, weak state 221–9°K 3=18113
 TbMn₂, Laves-phase, various props. 3=15910
 TbO₂, magnetic structure 3=15911
 Tb–Y alloys, helical mag. structure 3=15742

Magnetic properties of substances — contd**antiferromagnetic — contd**

- Ti₂O₃, mag. structure, neutron diffr. meas. 3=15862
 JO₂, paramag. susceptibility, neutron irradi. 3=15758
 UOS, mag. structure and transitions 3=13283
 UOS, Néel temp. and magnetic structure 3=15731
 V oxides, transition to paramagnetism, effect on energy spectrum, current carriers 3=6605
 V₂O₅ fine particles, susceptibility meas. 3=1095

diamagnetic

- See also de Haas–van Alphen effect; Diamagnetism.
 alkali metals, diamag. of cond. electrons 3=8638
 alloys, orbital suscept. of cond. electrons 3=20556
 elements with paired s electrons in outer shells 3=1119
 ferrite films, chem. deposited, various props. 3=16141
 ferrocene, anisotropy, rel. to chem. bonding 3=8639
 graphite, rel. to particle size 3=1120
 graphite, spin susceptibility, e.s.r. meas. 3=25501
 plasma, with large ion Larmor radius instability 3=7546
 Al, de Haas–van Alphen effect, rel. to Fermi surface 3=1121
 AlAs, susceptibility 3=18058
 AlSb, susceptibility 3=18058
 Bi, Sb impurities rel. to de Haas–van Alphen effect 3=3083
 Bi–BiI₃ molten solns. 3=11807
 C, pyro, heat treatment effects, up to 2900°K 3=20949
 C–C and C–H bonds, anisotropy 3=22585
 CH₄, BH₄⁺, NH₄⁺, isoelectronic systems, susceptibilities 3=22554
 CdS, single crystals, mag. susceptibility 3=4998
 FeS_{1.13}, origin, rel. to quenching and pressure squeezing 3=1024
 GaAs, susceptibility 3=18058
 GaSb, susceptibility 3=18058
 Ge, n-type, heavily doped, at high temps. 3=23135
 Ge, susceptibility, rel. to free carrier generation 3=3082
 HF molecule, suscept. calc. 3=8258
 HF molecule, susceptibility, theory 3=8240-1
 H₂ molecule, susceptibility, theory 3=8240-1
 He, susceptibility calc. 3=6348
 He, susceptibility, calc. 3=19929
 I, anisotropy 3=8640
 InAs, suscept., 60°–1200°K 3=11027
 InAs, susceptibility 3=18058
 InSb, susceptibility 3=18058
 Li, theory, weak-binding approx. 3=25500
 N₂ molecule, suscept. calc. 3=8259
 N₂ molecule, susceptibility, theory 3=8240-1
 S₈, liquid, and polymer chains, length 3=14155
 Sn, grey, diamag. susceptibility 3=16069
 Zn, magnetoresistance, transverse, and periodic mag. breakdown 3=20276
 ZnS, self- and Cu-activated, meas. 3=11028
 Zr, de Haas–van Alphen effect 3=25502

ferrimagnetic**See also Ferrimagnetism**

- ferrite memory cores, permeability ratios, rel. to nondestructive readout 3=15871
 ferrites, disaccommodation rel. to cation vacancies 3=3128
 ferrites F-1000, F-20, 78 and 191, u.h.f. meas. 3=5024
 ferrites, mag. spectra 3=3122
 ferrites, susceptibility, effect of compensation pt. 3=6719
 franklinite, magnon dispersion, by neutron scatt. 3=3127
 garnets, Bi substituted, spontaneous mag. 3=23191
 garnets, indirect spin coupling, theory 3=5021
 garnets, rare-earth ion Hamiltonian 3=13281
 magnetite, and rock magnetism 3=13845
 magnetoplumbite and garnet type 3=11099
 olivines, synthetic 3=23142
 perovskite, coexistence with ferroelectricity 3=6614
 BaCo₂F_{10-γ}O_{2γ}, hexagonal anisotropy 3=1029
 Ba ferrite, powder, single-domain props. 3=15880
 BaFe_{12-2x}Ir_xZn_xO₁₉, anisotropy, rel. to composition 3=1587
 Co₂TiO₄, 1.6°–400°K 3=1030
 Co_{2-x}Zn_xTiO₄, 1.6°–400°K 3=1030
 CrPt₃, mag. spin distribution 3=15880
 CrS_{1.17}, origin, rel. to quenching and pressure squeezing 3=1024
 Cu–Co alloys, dilute, down to 0.08°K 3=3132
 CuO–Fe₂O₃, magnetization and Curie point 3=18104

Magnetic properties of substances—contd**ferrimagnetic—contd**

- DyFe garnet, hyperfine interact. of 2^+ state of Dy¹⁶⁰ 3=1155
 Fe garnets, lighter rare-earth ions 3=20620
 FeMn ferrite, 1st anisotropy consts., mag. structure, temp. depend. 3=13273
 γ -Fe₂O₃, origin, rel. to quenching & pressure squeezing 3=1024
 FeTiO₃- α -Fe₂O₃, rel. to crystal structure 3=3133
 (1-x)FeTiO₃-xFe₂O₃, solid solns., anomalies by Mössbauer effect 3=997
 Gd-ceric earth mixed garnets 3=3125
 GdFe garnet, anisotropy 3=15787
 GdFe garnet, mag. structure at low temps. 3=3196
 LiTi ferrite, nonlinear effects at high powers elec. cond. effect 3=15887
 MgMn ferrite, hysteresis loops, rectangularity 3=13272
 MgMn ferrites, new materials for memory cores 3=15875
 MgMn ferrites, rotational hysteresis losses 3=18101
 Mn ferrite, effect of Li substitution 3=15891
 Mn-Al-Co, -Cu, -Fe, -Ni alloys, κ -phase 3=1007
 MnCo ferrite, at low temps. 3=5023
 MnCr₂O₄, mag. structure, neutron diffr. data 3=11101
 MnCr₂O₄, neutron diffraction 3=1112
 Mn_{2-x}Cr_xSb, X-ray and mag. studies 3=13282
 Mn_{2-x}Cr_xSb, x = 0.023-0.10, structure 3=23197
 MnFe₂O₄, low-field magnetization, temp. depend. 3=13271
 Mn_xFe_{3-x}O₄, mag. anisotropy, magnetoresistance 3=13270
 Mn-Ga, saturation magnetization and susceptibility temp. var. 3=15900
 Mn₂N, electron number of N atom 3=12890
 Mn₂Sb, aspherical spin density 3=15896
 MnTi_{1-x}Fe_{2-x}O₄, anisotropy 3=1028
 MnV₂O₄, spinel, structure, by neutron diffr. 3=5026
 Mn(60%)-Zn, β -phase b.c.c. CsCl-type, spontaneous magnetization 3=1006
 NaFe fluoride, ferrimag. props 3=25547
 Ni_{1-x}Co_xFe₂O₄, mag. anisotropy 3=1033
 Ni ferrite 3=13274
 Ni ferrite, single crystals 3=3270
 Ni_{1-x}Mn_{2+x}O₄, rel. to composition 3=13078
 NiO.(1-x)Fe₂O₃. xAl₂O₃, ferrimag. compensation pts. 3=13268
 Ni-Zn ferrites, diffusion aftereffect below 90°K 3=5022
 NiZnCo ferrite films, prep. and mag. props. 3=16140
 Sr ferrite, modified, new permanent magnet material 3=15881
 Sr ferrite, powder, single-domain props. 3=15880
 YFe garnet, heat transport by spin waves 3=8374
 YFe garnet, Nd-substituted 3=25546
 YFe garnet, spin-wave propag. and magnetoelastic interaction 3=15889
 YFe garnet, substitution of Mn²⁺, Fe²⁺ and Ni²⁺ 3=3129
 Y₂In_xFe_(6-x)O₁₂, (x < 0.5) anisotropy: magnetic moment ratio rel. to x 3=20800

ferromagnetic

- See also Ferromagnetic relaxation; Ferromagnetic resonance; Ferromagnetism; Magnetization process; Magnetization state.
 alloys, effective Curie-Weiss const., no. of mag. carriers 3=8666
 alloys, molten, susceptibility, rel. to concentration 3=23905
 alloys, ordering, theory 3=25518
 AlNi, anisotropy 3=18074
 Alnico, hysteresis, a.c. integrals, residual to saturation mag., ang. var. 3=25526
 Alnico, rel. to powder metallurgy 3=5142
 Bloch-wall oscillation excitation by ultrasound 3=20592
 chlorophaeite, effects of heating 3=1499
 critical temp., dilute ferromagnets 3=20553
 crystals, Raman spectra, observation possibility 3=8588
 Cunife alloy, anhysteretic suscept. 3=1144
 demagnetising field of ferromagnetic ellipsoids, meas. by e.s.r. 3=25519
 dielectric, high-freq. mag. susceptibility 3=3096
 domain structure of inf. cylinder with easy plane along axis 3=1062
 domain structures, quantum theory, pseudo-dipolar coupling 3=20588

Magnetic properties of substances—contd**ferromagnetic—contd**

- elastic wave instability, rel. to r.f. mag. fld. 3=18096
 Elinvar, temp. depend. 3=11053
 ferric oxides, hydr. ides, finely divided 3=3112
 ferromagnets, spin-lattice relax. during n.m.r. 3=6754
 50% and 79% Ni-Fe, with 4-5% Mo, tapes, 3-30 μ in. thick, mag. reversal, h.f. and impulse 3=15794
 films, anisotropic, permeability, theoretical and exptl. investigation 3=11078-9
 films, anisotropy 3=20604
 films, coercive force rel. to impurities 3=15824
 films, coercivity and domain structure, rel. to temperature 3=15813
 films, coupled, various mag. props. 3=15844
 films, dispersion angle meas. 3=25534
 films, domain boundaries, mag. field effects 3=20594
 films, domain structure 3=1149
 films, domain structure obs. by Faraday effect 3=15806
 films, domain walls and switching, obs. 3=20597
 films, interactions, induced by strip line faults 3=15820
 films, low-lying spin wave modes 3=11075
 films, mag. analysis by electron diffraction 3=5014
 films, Ni80Fe17Co3 alloy, varn. of dispersion angle with thickness 3=8675
 films, orientation, by deformation 3=20598
 films, permalloy easy axis, max. dispersion 3=15808
 films, ripple hysteresis 3=23172
 films, spontaneous magnetization 3=25533
 films, surface anisotropy energy 3=15841
 films, switching speed rel. to mag. fld. 3=23173
 films, thickness rel. to coercive field for wall motion 3=20603
 garnets 3=15867
 garnets, review of Russian work 3=3092
 hematite, and rock magnetism 3=13845
 Heusler alloys, mag. props. and crystal structure 3=15778
 hollow square crystal, Bloch wall motion rel. to creep phenomena 3=13248
 ilmenite-haematite system, low temp., superparamagnetism 3=8655
 Invar, magneto-diffusion, from internal friction, 0-440°C 3=11090
 Invar, magnetodiffusion effect, isothermal holding 3=3216
 iron 3=23301
 iron group borides, Curie points and moments 3=8637
 layers, magneto-optical investigation 3=18092
 magnetic scatt. of polarized neutrons, dislocations invest. 3=4871
 magnetization increase rel. to high fields 3=6706
 magnetoplumbite, domain spacing rel. to temp., and exchange const. 3=1062
 magnons and helicons 3=20570
 metals and alloys, rel. to d-electron Stark splitting 3=6645
 metals, effective Curie-Weiss const., no. of mag. carriers 3=8666
 metals, low-lying energy levels 3=20564
 Monel, Curie point, by simple balance method 3=8636
 neutron diffrn. phenomena, band-theoretical interpretation 3=25540
 nucleation fields, long, square prism 3=15771
 Permalloy, complex permeability of tapes 3=15854
 Permalloy, film, resonance linewidth and anisotropy, var. 3=13257
 Permalloy films, anisotropy 3=11057
 Permalloy films, anisotropy dispersion and error function 3=20601
 Permalloy, films, coercivity and conductivity, electrical 3=13041
 Permalloy films, domain structure 3=15812
 Permalloy films, domain structure changes 3=18088
 Permalloy films, effect of surface roughness 3=15840
 Permalloy films, effective magnetization, anisotropy 3=20596
 Permalloy films, impulsive magnetization 3=15848
 Permalloy films, isotropic 3=23169
 Permalloy films, longitudinal Kerr magneto-optical effect 3=13157
 Permalloy films, rel. to added Cu and Co 3=15816

Magnetic properties of substances — contd

ferromagnetic — contd

- Permalloy films, sputtered, anisotropy 3=15819
- Permalloy, longit, permeability of films 3=15831
- Permalloy, M-induced anisotropy rel. to minor constituents 4=1074
- Permalloy, mag. props. of very thin films 3=15832
- Permalloy, rel. to prep. method 3=1073
- Permalloy (78,83) films, anisotropy, 1 Mc/s 3=15828
- Permalloy 66, internal friction, due to ordering 3=11137
- Permalloy, various types of mag. film, props. 3=15836
- Permalloy, with 5% Mo, effect of proton irradiation 3=15861
- 66 Permalloy sheets, thickness depend. 3=11077
- permanent magnets, alternating hysteresis integral 3=6702
- Perminvar sheets, thickness depend. 3=11077
- polymers, with ferromag. impurities 3=20566
- powders, anisotropy distrib. detm. 3=1092
- rare earth compounds (24) 3=11038
- rare-earth cpds, (RAI₂-type structrs), spin moments, coupling 3=991
- rare earth cpds, with group V anions 3=20609
- rare earth ions, "paired" electron contrib. in Hartree-Fock formalism 3=977
- rare-earth iron garnets, sublattice magnetizations 3=25545
- rare earth metals, heavy, ordering, theory 3=973
- rare-earth metals, ordering 3=975
- rare-earth metals, spin-wave spectra, energy gaps 3=25525
- rare earth metals, spiral spin-configs., anisotropy effects 3=974
- relaxation time, in paramag. range 3=13265
- rotational hysteresis meas. 3=4239
- "silicon steel", domain structure, rel. to u.s. vibration and alternating magnetic fields 3=11069
- stainless steel, Néel temp., determ. using Mössbauer effect 3=23153
- steel, mild, var. with fatigue resistance 3=23301
- steel, SA-212B pressure-vessel, rel. to irradiation 3=11037
- steel, soft magnetic, prod. for British elec. generating industry 3=17015
- steel, transformer, 2-4% Si, coercive force and heat treatment 3=16101
- steel, Type E310, heat treatment, mag., effect of field on hysteresis and mag. curve 3=20584
- thin films, parallel, magnetostatic energy 3=3110
- thin films, two, coupling of magnetizations 3=3111
- transformer steels, domain wall widths 3=13252
- transition metal alloys, localized electron spins 3=8393
- transition metal ions, "paired" electron contrib. in Hartree-Fock formalism 3=977
- transition metals, correlated electron wave function in 3-d band as ground state 3=15769
- Vicalloy, anisotropy 3=18074
- Vicalloy II, mag. hardness and internal stresses 3=1139
- Vicalloy II, magnetic hardness, X-ray meas. 3=18095
- Vikalloy, structure, variation during tempering 3=5113
- Ag-Mn alloys, ferromag.-antiferromag. model 3=20585
- AlNiCo alloys, coercivity, improvement? 3=15795
- Au nuclei dissolved in Fe and Ni, local field sign 3=5007
- Au-1.5% Co alloy small particles, electron microscope exam. 3=1090
- Au-Co (1.57 wt.%), anisotropy, on cold rolling 3=20580
- Au₂Mn, ferromag.-antiferromag. spatially inhom. state 3=1003
- Au₂MnAl Heusler alloy, -190 to 400°C 3=25520
- Au-Ni alloy, effect of ferromag. precipitates 3=5138
- BaFe₁₂O₁₉ thin layers, domain width rel. to temp. 3=1014
- Ba_{1-x}Sr_x0.6Fe₂O₃, texture effects 3=20615
- BiFeO₃, magnetic ordering, by neutron diffraction, 20 and 600°C 3=5018
- Co, c-plane, domain structure, magnetostatic energy 3=11073
- Co, domain structure 3=1063
- Co, f.c.c., anisotropy, 4° to 850° K 3=1038
- Co, f.c.c., 1000 Å, domains, obs. 3=20605
- Co films, domain wall movements, electron microscope obs. 3=23168

Magnetic properties of substances — contd

ferromagnetic — contd

- Co films, domains 3=18086
- Co films, for n polarization, var. with electrolysis conditions 3=23509
- Co, Hall effect anisotropy 3=841
- Co, hexagonal, anisotropy 3=1141
- Co, induced anisotropy, rel. to temp. 3=1039
- Co, initial susceptibility, coercive force, temp. and deform. depend. 3=20576
- Co, internal field, Au¹⁹⁷ Mössbauer data 3=6458
- Co magnetic domain structure 3=15799
- Co, neutron form factors; spin density distrib. and Hartree-Fock calc. 3=1103
- Co, second anisotropy const. calc. 3=13246
- Co thin films, strip domain structure 3=20587
- Co, with chemisorbed H 3=5163
- Co²⁺ hydrated salts, susceptibilities 3=6691
- Co-Al alloys, oxidation, around Curie point 3=11337
- CoCO₃, anisotropy 3=3098
- Co-Cu, dilute alloys, ferromag. term 3=5028
- Co_{0.92}Fe_{0.08}, magnetic-nuclear neutron scattering amplitude 3=18099
- Co-Ni alloys, induced anisotropy, rel. to temp. 3=1039
- Co-Ni, mag. moments and degree of order 3=25539
- CoNi, moment distrib. 3=1110
- CoNi₂, moment distrib. 3=1110
- Co-Ni-P alloys, electrodeposited, effect of heat treatment 3=16097
- Co-Ni-P alloys, hard magnetic films 3=15835
- Co-P alloys, electrodeposited, effect of heat treatment 3=16097
- Co-P electrodeposits 3=11052
- CoPd, moment distrib. 3=1110
- CoPd₂, moment distrib. 3=1110
- Cr-Ir alloys 3=1900
- CrO₂, with var. V oxide, Curie temp., saturation moment 3=11054
- Cr-Rh alloys 3=1900
- Cu-2.4% Co alloy small particles, electron microscope exam. 3=1090
- Cu formate 4 H₂O, weak, along L₁ and L₂ axes 3=1060
- Cu-Mn alloys, ferromag.-antiferromag. model 3=20585
- Cu-Mn, polycryst., below Néel point 3=4997
- Cu-Mn-Al, κ-phase, neutron diffn. study 3=11093
- Cu₂MnSb, mag. props. and crystal structure 3=15778
- Cu-Ni-Fe hysteresis a.c. integrals, residual to saturation mag., ang. var. 3=25526
- Dy, antiferromagnetic transform., exchange interaction mechanism 3=20573
- Dy, spin wave spectrum and specific heat 3=3095
- Dy, spiral structure model 3=3075
- Er, spiral structure model 3=3075
- Eu cpds., indirect exchange between electrons 3=5003
- EuS 3=11038
- EuS, at low temps. 3=1140
- EuS, 14.3-32.1 kOe and low temps. 3=11050
- EuS, paramag. and ferromag. Curie temps. 3=3080
- EuS, second-neighbour exchange interact. 3=15781
- EuS, spin-wave contrib. to specific heat 3=2729
- EuSe 3=11038
- EuSe, at low temps. 3=1140
- EuSe, ferromag. Curie temp. 3=3080
- EuSe, 14.3-32.1 kOe and low temps. 3=11050
- EuTe, paramag. Curie temp. 3=3080
- Fe, anisotropy of wires under small torsion 3=20577
- Fe carbonyl powders, permeab., hysteresis loss factors 3=11089
- Fe, charged with H, saturation induction 3=6703
- Fe, Curie pt. thermodynamics 3=13244
- Fe, de Haas-van Alphen effect, internal mag. field for conduction electron 3=20558
- Fe, "drag band", rel. to neutron irradiation 3=8469
- Fe, effect of proton irradiation 3=15863
- Fe, electron mag. scattering amplitude 3=1102
- Fe, f.c.c. phase, Néel temp., determ. using Mössbauer effect 3=23153

Magnetic properties of substances—contd**ferromagnetic—contd**

- Fe, films 3=20600
 Fe, films, anisotropy, effect of crucible materials 3=18082
 Fe films, coercive field strength 3=15810
 Fe films, longitudinal Kerr magneto-optical effect 3=13157
 Fe films, Procopin and magnetization effects rel. to thickness 3=3109
 Fe foils, polarization of transmitted electron beams 3=2042
 Fe, internal field, Au¹⁹⁷ Mössbauer data 3=6458
 Fe, intrinsic magnetization, press. depend. 3=6700
 Fe, mag. saturation induction, increase by H absorption 3=1145
 Fe, magnetocryst. anisotropy rel. to field strength 3=20581
 Fe, neutron effects, very pure 3=23179
 Fe, neutron form factors, spin density distrib. and Hartree-Fock calc. 3=1103
 Fe particles, effect of Co alloying 3=15850
 Fe, polarized neutron scatt., spin wave theory 3=6717
 Fe, powdered, Bloch wall suppression, n.m.r. study 3=15805
 Fe, rel. to band structure 3=8665
 Fe, second anisotropy const. calc. 3=13246
 Fe, susceptibility, 1000°C 3=15785
 Fe thin film on MgO surface, domain wall struct. 3=1080
 Fe thin films, rel. to evaporation 3=1070
 α -Fe, diff. of Au, Co, Ni, effect of ferromagnetism 3=22810
 δ -Fe, diff. of Co⁶⁰ and Fe⁵⁹ 3=22811
 Fe²⁺ hydrated salts, susceptibilities 3=6697
 Fe alloys, Mössbauer effect studies 3=25521
 Fe-Al alloy, effect on elastic consts. 3=25605
 Fe-3% Al alloy, magnetic texture and other props of sheets 3=15855
 Fe-Al alloys, oxidation, around Curie point 3=11337
 Fe, Al, and equil. diag. 3=3326
 Fe₃Al, ordered, mag. structure 3=8334
 Fe-Al single crystals, mag. annealing effect rel. to comp. 3=1040
 Fe-C alloys, austenitic, C up to 0.97%, susceptibility 3=15785
 Fe₃C, domain structure 3=23163
 FeCl₂·4H₂O; Fe⁵⁷ Mössbauer absorption patterns, quadrupole splittings 3=996
 Fe-Co alloys, anisotropy const. rel. to long-range order 3=1355
 Fe-Co alloys, effect of Mn substitution 3=15784
 Fe-Co ternary alloys, saturation moments 3=3103
 FeCo ferrites, rotational hysteresis, domain dynamics 3=13269
 Fe-Co-Ni alloys, anisotropy 3=1097
 (Fe,Co)₂P alloys, Curie temps. and coercivities, ground to diff. degrees of fineness 3=15786
 Fe-Co-V alloy, anhysteretic suscept. 3=1144
 Fe cpds., by Mössbauer effect 3=995
 Fe₄N, mag. structure, by X-ray scatt. 3=8846
 Fe(NH₄)₂(SO₄)₂·6H₂O; Fe⁵⁷ Mössbauer absorption splittings 3=996
 Fe(50%)-Ni alloy, anisotropy energy rel. to 1 MeV electron irradi., 280°C 3=3119
 Fe-Ni alloys, anisotropy const., rel. to long-range order 3=1355
 Fe-Ni alloys, atomic props., effect of pressure 3=3097
 Fe-Ni alloys, atomic props., effect of pressure 3=6699
 Fe-Ni alloys, complex permeability of tapes 3=15854
 Fe-Ni alloys, effect of uniaxial tension and compression 3=3102
 Fe-Ni alloys, Invar type, Curie pt. meas. 3=25607
 Fe-Ni alloys, magnetization rel. to composition 3=8670
 Fe-Ni alloys, moments and degree of order 3=1106
 Fe-Ni alloys, rel. to irradi.-induced defects 3=22729
 Fe-Ni alloys, short-range order study 3=25522
 Fe(50%)-Ni(50%), anisotropy, rel. to neutron irradi. 3=11056
 Fe-Ni, electroplate film 3=13259
 Fe-Ni, f.c.c. two structures, Curie point 3=20114
 Fe-Ni films, anisotropy 3=11082
 Fe-Ni films, domain structure rel. to temp. 3=11081
 Fe-Ni, Invar, magnetic diffusion 3=15977
 FeNi, moment distrib. 3=1110

Magnetic properties of substances—contd**ferromagnetic—contd**

- FeNi₄, moment distrib. 3=1110
 Fe-Ni-Cr alloy, anhysteretic suscept. 3=1144
 Fe-Ni-Mo alloy, crystalline anisotropy, rel. to ordering and thermomagnetic treatment 3=25538
 Fe-Ni-Mo alloy, films 3=20600
 Fe(17%)-Ni(79%)-Mo(4%), anisotropy 3=11082
 Fe-Ni-Mo films, domain structure rel. to temp. 3=11081
 FeO-Fe₂O₃-TiO₂, as basis of rock magnetism 3=1497
 α -Fe₂O₃, magnetization and susceptibility curves 3=25523
 α -Fe₂O₃, parasitic, exptl. study 3=1021
 α -Fe₂O₃, temp. effects 3=20575
 α -Fe₂O₃-Al₂O₃, susceptibility 3=18077
 γ -Fe₂O₃, thin film, remanent magnetization 3=13256
 Fe₃O₄, compressed powder, remanent effect 3=1498
 Fe₃O₄ films magnetization meas., by electron diff. 3=23181
 Fe₃O₄, mag. crystal structure 3=1148
 Fe₃O₄, magnetocryst. anisotropy meas. 3=20582
 Fe₃O₄, Nernst-Ettinghausen effect, longitud. 3=25532
 Fe₃O₄, spin-wave contrib. to specific heat 3=25200
 Fe₃O₄, spin-wave dispersion curves eval. 3=1152
 Fe₃O₄, spin wave spectra calc. 3=15782
 Fe₃O₄, spin waves, by neutron scatt. 3=3120
 Fe₃O₄- γ -Fe₂O₃- α -Fe₂O₃, 10⁻⁴-4 × 10⁸ c/s 3=18071
 FeP 3=1018
 Fe₂P 3=1018
 Fe₃P 3=1018
 Fe-P-B system, two new ferromags. 3=1134
 Fe-Pd alloys, γ -phase, moment rel. to comp. 3=998
 FePd, moment distrib. 3=1110
 FePd₃, moment distrib. 3=1110
 Fe-Re, mag. field at Re nuclei, from nucl. mag. sp. ht. 3=6479
 Fe₃Rh_{0.83}, mag. moments, localized, by neutron diff. 3=15856
 Fe₂S₈, anisotropy const., temp. depend. below 205°K 3=15770
 Fe₂S₈(pyrrhotite), anisotropy and spont. magnetization 3=15788
 FeSO₄·7H₂O; Fe⁵⁷ Mössbauer absorption patterns, quadrupole splittings 3=996
 Fe-Sb, mag. field at Sb nuclei, from nucl. mag. sp. ht. 3=6479
 Fe-Si alloy, ellipsoidal, shape effects 3=3116
 Fe-Si, disaccommodation, effect of temp. 3=8653
 Fe-3%Si, effect of annealing in mag. field 3=15804
 Fe-Si, frame-type crystal, disaccommodation 3=1044
 Fe-Si, mag. diffusion after-effects 3=1043
 Fe-Si, magnetostriction and grain interaction 3=5016
 Fe-(3%) Si, relaxation, rel. to n-irrad. 3=1042
 Fe-Si sheet, magnetostriction 3=8679
 Fe-Si sintered alloys, effects of processing 3=3118
 Fe-3%Si, var. with field and rolling direction 3=6704
 Fe₂Si, Fe₃Si₂, studied by Mössbauer effect 3=23180
 Gd, anisotropy 3=15789
 Gd, domains, -5°C, Bitter patterns, wall movement 3=18081
 Gd, ferromag. Hall effect, origin 3=15556
 Gd single crystals, magnetostriction 3=6714
 Gd₂Bi₃, prep., Curie temp. 3=15776
 GdCl₃ susceptibility & magnetization meas., 1·5° to 20°K 3=1057
 HoIr₂, structure, by neutron diff. 3=23185
 HoNi, temp. depend. 3=13245
 (1-x)LaFeO₃ - xSr(Ni_{0.5}W_{0.5})O₃ 3=5025
 Mn-Al, Cu substituted, effects of Cu content 3=25529
 MnAs, MnBi, MnP, Mn₂Sb, internal mag. fields 3=3198
 MnAu₂, antiferromagnetic, transform., exchange interaction mechanism 3=20573
 MnB, rel. to electronic structure 3=6488
 Mn-Bi alloy, small particles, domain struct. rel. to temp. 3=18093
 MnBi, mag. switching rel. to particle size 3=13251
 MnBi, microcryst. particles, reversal processes 3=8657
 MnCO₃, anisotropy 3=3098
 MnCO₃, r.f. suscept. meas. 3=11051
 MnCO₃, transition, rel. to specific heat, 1.6° to 70°K 3=17659

Magnetic properties of substances—contd**ferromagnetic—contd**

- Mn_xFe_{3-x}O₄, anisotropy, origin 3=11058
 Mn₂Ge₂, magnetiz. curves, anomalies 3=15775
 Mn₂Ge₃, domain struct. and mag. props. 3=1086
 Mn₂Ge₃, domain structure rel. to external mag. fld. 3=3107
 Mn₂Ge₃, mag. anisotropy 3=23154
 Mn₂Ge₃, mag. and domain struct., near Curie temp. 3=13250
 Mn, Mn—Mg ferrites, rectangular hysteresis loop 3=23189
 MnP, room temp. props. 3=15735 3=15735
 MnPt₂, mag. spin distribution 3=15860
 MnYO₃, ordering of Mn³⁺ ions, from neutron diffr. exam. 3=20610
 MnZn ferrite, mag. curves rel. to pressure 3=13277
 Mn—Zn—Fe ferrites, permeability, anisotropy 3=20619
 NdCd₁₁, susceptibilities, 2° to 300°K 3=13237
 NdH (x = 2.02–2.75), variation with temp. 3=15744
 Ni, coercive force, influence of heat treatment 3=11059
 Ni, anisotropy of wires under small torsion 3=20577
 Ni, Curie pt. thermodynamics 3=13244
 Ni, domain structure 3=20591
 Ni, effect of pressure during evaporation 3=1072
 Ni film, 650Å thick, hysteresis loop 3=24424
 Ni films anisotropic shape effects 3=15815
 Ni films, chemically precipitated 3=5013
 Ni, films, evaporated, single crystal, effect of internal stresses 3=13344
 Ni films, longitudinal Kerr magneto-optical effect 3=13157
 Ni films, mag. analysis by electron diffraction 3=5014
 Ni, films, magnetization, saturation, effect of electrolytic H 3=20606
 Ni films, from magnetoresistance meas. 3=17825
 Ni films, rel. to thickness and structure 3=15823
 Ni films single and polycrystalline, domain structure obs. 3=18089
 Ni, Hall effect anisotropy 3=841
 Ni, internal field, Au¹⁹⁷ Mössbauer data 3=6458
 Ni, intrinsic magnetization, press. depend. 3=8700
 Ni, mag. stray fields at 71° walls, meas. 3=6707
 Ni, magnetocryst. anisotropy rel. to field strength 3=20581
 Ni, moment distrib. 3=1110
 Ni, neutron critical scattering 3=1117
 Ni, neutron form factors; spin density distrib. and Hartree—Fock calc. 3=1103
 Ni, polarized neutron scatt., spin wave theory 3=6717
 Ni powdered, Bloch wall suppression, n.m.r. study 3=15805
 Ni, rel. to band structure 3=8665
 Ni, rel. to plastic deformation, det. of hardening curve 3=3231
 Ni, second anisotropy const. calc. 3=13246
 Ni single crystals, reversible susceptibility, rel. to magnetizing field and crystal orientation 3=20572
 Ni, stray fields above Bloch walls, meas. method 3=19402
 Ni, temperature hysteresis 3=3101
 Ni thin layers, Curie point 3=1077
 Ni ultrathin films saturation and anisotropy 3=15822
 Ni wire, remanence/saturation mag. ratio, -180 to +100°C 3=23160
 Ni, wires, annealed, remanence, temp. depend. 3=15793
 Ni wires, thin, domain struct. and magnetization process 3=1087
 Ni alloys, curves after demag., stress effects 3=11061
 Ni alloys, rel. to magnetoresistance and Hall effect 3=15551
 Ni alloys, with Ce, Pr and Cd, coercive force, deformation and annealing effects 3=23159
 Ni-base alloys, neutron scatt. theory 3=12964
 Ni—Co alloy, anisotropy, ordering theory 3=18073
 Ni—Co alloys, domain patterns, rel. to composn. 3=18079
 Ni—Co alloys, relaxation and related phenomena 3=8681
 Ni—Co f.c.c. solid soln., induced anisotropy 3=1041
 Ni—Co—P, shape anisotropy, rel. to underlying Au film 3=20602
 Ni—Cr alloys, mag. moments, neutron diffr. study 3=20608
 NiF₂, r.f. suscept. meas. 3=11051
 Ni—Fe alloy, anisotropy, ordering theory 3=18073
 Ni—Fe alloys, small-signal behaviour, domain wall model 3=25528
 Ni(40–100%)—Fe, anisotropy 3=1069

Magnetic properties of substances—contd**ferromagnetic—contd**

- 48% Ni—Fe, cubic face-centred, -130°C, and diffusion, H 3=15853
 Ni—Fe f.c.c. solid soln., induced anisotropy 3=1041
 Ni—Fe films, anisotropy, positive and negative 3=1067
 Ni—Fe films, Bloch lines 3=15809
 Ni—Fe films, coercive force rel. to composition 3=25537
 Ni—Fe films, domain behaviour rel. to anisotropy 3=15811
 Ni—Fe films, domain struct. and magnetization reversible rotation by Faraday effect 3=1079
 Ni—Fe films, domain structure, rel. to internal stresses 3=20595
 Ni—Fe, films, magnetization reversal, static 3=13236
 Ni—Fe films, negative anisotropy 3=15807
 Ni—Fe films, rel. to anisotropy dispersion 3=18083
 Ni—Fe films, rotatable mag. anisotropy, rel. to magnetostriction 3=15843
 Ni—Fe films, spontaneous magnetization 3=22907
 (80%)Ni—(20%)Fe films superimposed, domain wall interaction 3=18085
 Ni(40–100%)—Fe films, uniaxial anisotropy, torque meas. 3=15814
 Ni—Fe films, wall movement, field strength 3=18090
 Ni—Fe, thin films, anisotropy 3=1068
 Ni₃Fe, anisotropy, on annealing 3=23155
 Ni₃Fe, anisotropy, rel. to ordering theory 3=18072
 Ni—Fe—Co films, reversal, rel. to appl. field inhomogeneity 3=23171
 Ni ferrite, resistivity, change on mag., anisotropy 3=17927
 Ni and Co ferrite—chromite series, theory for normal spinel structure 3=25544
 Ni—Fe ferrite, relaxation loss 3=8691
 Ni—Mn, magnetostriction 3=23177
 Ni₃Mn, mag. structure rel. to order 3=18080
 Ni₃Mn, and ordering kinetics 3=3329
 NiO, neutron form factor 3=1104
 Ni—Pd alloy, effect of hydrogenation 3=20269
 Ni—Pd alloy, neutron scatt., rel. to H content 3=5020
 Ni—10.1 at.% Ti, Curie temp., rel. to Ti precipitation 3=25755
 Ni—Zn—Co ferrites, magnetocryst. anisotropy 3=23190
 NiZnCo ferrites, magnetoelastic effects 3=20614
 Pd, moment distrib. 3=1110
 Pd—Fe alloy, mag. interaction of Fe 3=3078
 Rh—Fe mag. structure 3=3320
 Si(2–4%)—Fe, coercive force and heat treatment 3=16101
 Si—Fe, containing C, diffusion after-effects 3=13254
 Si (3.5%)—Fe, domain structure, 0–600°C, from longitudinal Kerr effect 3=11071
 Si—Fe films, domain patterns, contrast effect 3=11076
 3% Si—Fe, initial mag. curve, tension effects 3=25527
 Si—Fe sheet, transformer, grain-oriented, after annealing 3=16098
 Si steel sheet, mag. structure, demagnetization effects 3=13253
 Tb, neutron diffraction detm. 3=1108
 TbIr₂, structure, by neutron diffr. 3=23185
 Ti³⁺ hydrated salts, susceptibilities 3=6691
 TiFe₂—ZrFe₂ 3=20880
 UCD₁₁, susceptibilities, 2° to 300°K 3=13237
 UFe₂ 3=1113
 UFe₂, 4–200°K, comparison with theory 3=15791
 UH₃ and UD₃, magnetization per mole, 4–2°, 77–4°K 3=8673
 V³⁺ hydrated salts, susceptibilities 3=6691
 V—Co—Fe alloys, effect of elastic stresses 3=3115
 V—Fe alloy, atomic mag. moment by diffraction 3=1105
 V₂O₃—V₂O₅, 9 phases, Neel, Weiss temps. 3=15779
 YCO₃, room temp. and below 3=15731
 (1-x){Y₃}[Fe₂](Fe₂O₄)_{1-x}—x[Ca₂³⁺][Fe₂](Si₂⁴⁺)O₄ 3=5025
 (1-x){Y₃}[Fe₂](Fe₂O₄)_{1-x}—x[YCa₂³⁺][Fe₂](Fe₂V³⁺)O₄ 3=5025
 YFe garnet, magnetostriction 3=15852
 YFe garnet, multiple magnon processes 3=18122
 YFe garnet, rare earth doped, anisotropy, 4·2° to 1·5°K 3=1049

Magnetic properties of substances—contd ferromagnetic—contd

- YFe garnets, Nd and La substituted, abs. saturation magnetization & remanence 3=1047
 ZnFe_2O_4 — NiFe_2O_4 system, superparamagnetism 3=8645
 Zn — Mn (25%), with Hf_2Sn -type superlattice by annealing 3=1006
 ZrCo_2 — ZrFe_2 3=20880
 ZrSiO_4 , rel. to e.s.r. 3=23239
- ## paramagnetic
- See also Paramagnetic resonance and relaxation; Paramagnetism.
- alkali metals, theory, electron correl. 3=12947
 brass, susceptibility rel. to impurities 3=18061
 chromates, susceptibilities, 80–360°K 3=5000
 corundum, Fe^{3+} , mag. dipoles, transfer energy 3=13230
 corundum, V^{3+} doped, meas. analysis 3=20548
 crystals, Raman spectra, observation possibility 3=8588
 cupric acetate monohydrate, exchange integrals 3=25505
 electron gas, free, susceptibility, rel. to sample size 3=15475
 elements with unpaired d and f electrons in outer shells 3=1123
 ferrite with three mag. sublattices 3=23188
 ferrites, mixed, susceptibility 3=6722
 ferromagnetic films, above Curie point 3=20607
 gallates, rare earth, susceptibility, 300–1500°K 3=6693
 hard superconductors, critical field, upper limit 3=337
 olivines, synthetic, susceptibility, 77°–300°K 3=23142
 rare earth cpds. with group V anions 3=20609
 rare earth monosulphides and nitrides 3=20342
 rare earth salts, susceptibility rel. to temperature 3=13231
 rare earth Fe garnets, susceptibility, 20° to 1·5°K 3=1052
 ruby, relax. time meas., d.c. magnetiz. technique 3=13306
 molecular chain "fluids", susceptibility 3=6445
 transition metal alloys, b.c.c., susceptibility, rel. to temp. 3=999
 transition metal alloys with Fe (1 at.%), moment 3=993
 superconductors, D-band; orbital 3=336
 Wurster's blue perchlorate, mag. susceptibility 3=11034
 Ag — Mn alloys, susceptibility 3=8643
 Ag — Sn — Mn alloys, susceptibility 3=8643
 $\text{Ba}(\text{NiW})_x\text{O}_y$, susceptibilities, phase transforms. 3=8864
 C , pregraphitic 3=15759
 $\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$, susceptibility, liquid He temps. 3=8718
 Ce — Eu alloys, susceptibility, rel. to electron structure 3=15757
 Ce : LaAl_2 , mag. structure 3=20071
 $\text{Ce}_2\text{Mg}_3(\text{NO}_3)_{12}$, rel. to crystal field 3=8333
 CoAsS , and cond. elec., temp. var. 3=6601
 CoB , 150–800°K range 3=1124
 $\text{CoSO}_4 \cdot 7\text{H}_2\text{O}$, magnetothermodynamic data, 0–100 kG 3=25504
 CoUO_4 , structure at low temps. 3=3139
 Cr alum, nonresonant acoustic absorpt. in mag. field 3=22652
 Cr , induced orbital paramagnetism 3=20561
 Cr , susceptibility rel. to electronic sp. ht. 3=8363
 CrB , 150–800°K range 3=1124
 Cr — Mn , b.c.c. susceptibility, rel. to temp. 3=999
 Cr_2O_3 , fine grains, superparamagnetism 3=1093
 Cr_2O_3 , ion pair model, Oguchi analysis 3=25503
 Cu — Mn alloys, superparamagnetic properties 3=25506
 Cu — Mn , polycryst., above Néel point 3=4997
 Cu — Ni alloy, rel. to short range order 3=3085
 Dy , paramag.—antiferromag. transition, pres. effects 3=20552
 Dy , spiral structure model 3=3075
 Dy , 300°–1500°K 3=11033
 DyH_{2-3} , Curie—Weiss law 3=25507
 Dy_2O_3 , hyperfine splitting of Dy^{161} levels 3=4999
 ErH_{2-3} , Curie—Weiss law 3=25507
 Fe salts, susceptibility rel. to temperature 3=13231
 FeAs_2 , and cond. elec., temp. var. 3=6601
 FeAsS , and cond. elec., temp. var. 3=6601
 FeB , 150–800°K range 3=1124

Magnetic properties of substances —contd paramagnetic —contd

- FeCl_2 , near Néel temp., neutron small-angle scatt. 3=11035
 FeCl_3 , susceptibility, isotropic character 3=5049
 Fe — Ge alloys, meas. and theory 3=11030
 α — Fe_2O_3 , fine grains, superparamagnetism 3=1093
 $(1-x)\text{FeTiO}_3$ — $x\text{Fe}_2\text{O}_3$, superparamag. clusters 3=1022
 Gd , 300°–1500°K 3=11033
 Ge , n-type, lightly doped, var. with carrier conc. 3=23135
 Hf — Ta , b.c.c., susceptibility rel. to temp. 3=999
 HgTe , susceptibility, 90–400°K 3=20563
 Ho , 300°–1500°K 3=11033
 KCl , F' -centre 3=2840
 KCrO_4 soln., magnetic susceptibility 3=146
 KMnO_4 soln., susceptibility 3=146
 $\text{La}_2\text{Co}_3(\text{NO}_3)_{12} \cdot 24\text{H}_2\text{O}$, phonon scatt., reson. low temp. 3=15427
 Mn alloys, interactions 3=1001
 Mn , susceptibility in α , β brasses 3=23140
 Mn — Cu alloys, above m.p. 3=23906
 MnB , 150–800°K range 3=1124
 MnF_2 , exchange integrals, by neutron scatt. 3=3120
 MnO fine grains, superparamagnetism 3=1093
 MnRh ordered alloy, 700–170°K range 3=15752
 MnUO_4 , structure at low temps. 3=3139
 Mo — Re alloy, b.c.c., rel. to H-affinity 3=3084
 Na , cond. electron spin suscept. meas. 3=11031
 Na , cond. electron susceptibility meas. by e.s.r 3=1053
 $\text{Na}_2\text{Cr}_2\text{O}_7$ soln., susceptibility 3=146
 Nb — Mo alloy, b.c.c., rel. to H-affinity 3=3084
 Nb — Mo , b.c.c., susceptibility rel. to temp. 3=999
 Nb — Re alloy, b.c.c., rel. to H-affinity 3=3084
 Nb — Ru alloys 3=22662
 Nb — Ta , b.c.c., susceptibility rel. to temp. 3=999
 $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ soln., susceptibility 3=146
 Ni films, from magnetoresistance meas. 3=17825
 Ni ultra-fine particles, superparamagnetism in Ar atmosphere, rel. to pressure 3=11036
 NiB , 150–800°K range 3=1124
 Ni , Ni — Cu , spin paramag. susceptibility, temp. depend. 3=23143
 NiO fine grains, superparamagnetism 3=1093
 α — $\text{NiSO}_4 \cdot 6\text{H}_2\text{O}$, $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$, low temp. susceptibilities 3=8644
 Ni — Zn ferrites, susceptibility 3=20336
 Pd alloys, binary, meas. and theory 3=1126
 Pd , 1.85–2.93°K meas. 3=13229
 Pd , Pd — Ag , Pd — Rh , susceptibility and electronic sp. ht. 3=13228
 Pd — Rh alloys, 1.85–2.93°K, meas. 3=13229
 PtSn_3 , Pt^{195} resonance Knight shift 3=5051
 $\text{Sr}(\text{NiW})_x\text{O}_y$, susceptibilities, phase transforms. 3=8864
 Ta — Re , b.c.c., susceptibility, rel. to temp. 3=999
 Ta — W , b.c.c., susceptibility rel. to temp. 3=999
 Tb hexa-antipyrene tri-iodide, susceptibility 3=1125
 Tb , 1.4°–500°K meas. 3=18113
 Tb , 300°–1500°K 3=11033
 Te susceptibility, temp. var. 3=18063
 TiO , 80°–400°K 3=17894
 Ti — V , b.c.c., susceptibility rel. to temp. 3=999
 Ti , V — Ti alloys, temp. variations 3=25509
 Ti halides, h.f., ligand field theory 3=20560
 TmH_{2-3} , Curie—Weiss law 3=25507
 UO_3 , susceptibility 3=8642
 U_2O_8 , susceptibility, to determine valency 3=8642
 U_3O_8 , susceptibility, temp. var. 3=8642
 UOS , in paramag. region 3=13283
 UOS , susceptibility, temp. var., two Curie consts., explanation 3=15760
 V alloys with Ti , Cr , Tc , meas. 3=3204
 V -base solid solns., rel. to concn. 3=18062
 V oxides, transition to antiferromagnetism, effect on spectrum, current carriers 3=6605
 V , V — (Cr, Ti) alloys, temp. variations 3=25509
 VB , 150–800°K range 3=1124
 V — Cr , b.c.c., susceptibility, rel. to temp. 3=999
 V — Fe alloys, susceptibilities meas. 3=23141

Magnetic properties of substances — contd

paramagnetic — contd

- Yb₂(SO₄)₃·8H₂O, susceptibilities, principal, crystal field nature 3=25510
- Zn—Mn (15–35 at. %) h.c.p. structure 3=1006
- Zn—Mn (20%, γ -brass type; and 27% α' -phase f.c.c. Cu₃Au type), Curie temps. 3=1006
- Zr—Nb, b.c.c., susceptibility, rel. to temp. 3=999

transitions

- diamond, Ising model, statistics 3=12898
- ferro—antiferromagnetic, entropy changes 3=15750
- ferromag. thin films, Curie point meas. 3=6710
- ferromag.—paramag., first order, rel. to disorder 3=1002
- haematite—ilmenite system, Néel temp. calc. 3=18105
- magnetite, low-temp. transformation 3=9138
- magnon renormalization near transition temp. 3=15751
- rare-earth metals, rel. to elec. resistance 3=13032
- Co, susceptibility at γ /d and melting point 3=8654
- CoF₂—ZnF₂, Néel temp. by n.m.r. 3=1055
- CrO₂, Curie temperature, meas. 3=17022
- Cu(HCO₃)₂·4H₂O, antiferromag. 3=15780
- Dy 3=25507
- Dy, antiferro-ferromag. at 86°K, rel. to crystal structure 3=15755
- Dy, ferromagnetic—antiferromagnetic, crit. fld. meas. 3=17022
- Dy, ordering, rel. to lattice parameters 3=15444
- Dy₂Al₂O₇, Néel temp., specific heat anomaly 3=15436
- DyH₂, Néel point 3=25507
- Er 3=25507
- ErH₂, Néel point 3=25507
- Fe, Curie pt. sp. ht. discontinuity and atomic mag. moment change 3=23136
- Fe, internal field, from Mössbauer effect, 4–1300°K 3=6457
- Fe, susceptibility of γ /d and melting point 3=8654
- Fe—Co—Ni alloys, Curie temp. prediction 3=11025
- FeCO₃ (siderite), Néel point 3=15749
- Fe₂O₃, α -phase, antiferromagnetic 3=5029
- α -Fe₂O₃, low-temp. rel. to remanent magnetization, memory effect 3=1020
- Fe—Rh alloys, Fe⁵⁷ Mössbauer effects 3=17632
- x FeTiO₃(1-x)Fe₂O₃, hematite, Curie point detm. 3=1098
- FeTiO₃—Fe₂O₃, reverse thermoremanent 3=13255
- Gd, Curie temperature 3=17022
- Gd, ordering, rel. to lattice parameters 3=15444
- Ho, ferromagnetic—antiferromagnetic, crit. fld. meas. 3=17022
- Ho, ordering, rel. to lattice parameters 3=15444
- KFeS₂, Curie point meas. 3=12894
- LiMnPO₄, paramag—antiferromag. 3=18151
- MnAs, first-order transition 3=15753
- MnAs, to ferromag., first-order 3=13226
- MnCl₂, liq. He temps., rel. to specific heat 3=2731
- Mn_{1-x}Cr_xSb, antiferromagnetic—ferrimagnetic, meas. 3=17022
- Mn_{2-x}Cr_xSb, ferrimag—antiferromag. 3=13282
- Mn—Cu alloys, susceptibility rel. to temp. 3=3081
- MnF₂—ZnF₂, Néel temp by n.m.r. 3=1055
- MnHg, -75°C, due to crystal distortion 3=6860
- MnP, 50°K transition to metamagnetic state 3=15735
- MnRh ordered alloy, para—antiferromag. ~~trans~~ transition 3=15752
- Mn₂Sb, antiferro—ferri, first-order 3=1026
- MnSn₂, 73°K transition 3=15754
- MnTe₂, powder, neutron diffraction analysis, rel. to temp. 3=5019
- MnZn, -125°C, due to crystal distortion 3=6860
- Ni, susceptibility at γ /d and melting point 3=8654
- Ni thin layers, Curie pt. 3=1077
- NiS, para—antiferromagnetic, neutron diff. study 3=15748
- Pd—Co alloys 3=992
- Pd—Fe alloys 3=992
- Pd—Mn alloys 3=992
- Pd—Ni alloys 3=992
- Pt—Co alloys 3=992
- Pt—Fe alloys 3=992

magnetic properties of substances — contd

transitions — contd

- Pt—Mn alloys 3=992
- Pt—Ni alloys 3=992
- Tm 3=25507
- TmH₂, Néel point 3=25507
- V, antiferromag., rel. to thermoelec. 3=13140
- YFe garnet, Curie temp. rel. to Ga and In substitutions 3=1048
- Y₃In_xFe_{3-x}O₁₂, (x < 0.5), Curie temp. rel. to x 3=20800

Magnetic resonance and relaxation

- See also Antiferromagnetic resonance; Antiferromagnetic resonance; Ferrimagnetic resonance; Ferromagnetic relaxation; Ferromagnetic resonance; Nuclear magnetic resonance and relaxation; Paramagnetic resonance and relaxation.
- Ampere Colloquium, Eindhoven (1962) 3=20629
- Ampere Colloquium, Leipzig (1961) 3=23198
- Bloch eqns. for low mag. fields, approx. soln. 3=6744
- double resonance spectra, symmetry properties 3=13312
- electric shifts 3=23199
- ferromagnets above Curie temp., Green's function theory 3=25561
- modulation of light in double resonance 3=22474
- optical methods, recent developments 3=21985
- paramagnetic crystals, usage in devices, review 3=24505
- proton resonance spectroscopy, spin decoupling by double resonance 3=24496
- relaxation, Green's function theory 3=15726
- resonance in matter, review 3=5031
- statistical mechanical theory 3=21254
- sweeping of mag. field about stabilized mean value 3=19405
- teaching demonstration model 3=14736
- CrBr₃, magnetostatic modes, visual obs. 3=23200
- Gd—Y alloys, microwave resonance results 3=15941
- NiFe ferrite, mag. anisotropy, 200–300°C 3=6726

Magnetic storms

- association with solar flares, 1949–61 3=21110
- auroral distrib. change during 11 Feb. 1958 storm 3=3520
- auroral electron precipitation, long period, and X-rays, hydromag. disturbances 3=23631
- calc., storminess, for high-lat. observatories 3=18571
- Chapman—Ferraro theory, effects of ionized interplanetary gas 3=13835
- chromospheric flares, correl. with 3=1522
- conference, Kyoto, 1961 3=15054
- correl. with radio emission of solar flares 3=11475
- cosmic noise absorption during SSC 3=9135
- current theories, review 3=3518
- DS variation rel. to storm time, analysis 3=1490
- Dst(H), rel. to quiet auroral arcs 3=6995
- earth's field induction, theory 3=9123
- effect on radio star scintillations 3=11603
- effects of high altitude nuclear explosion 3=13696
- and electromag. blackouts, polar cap, long delay times lack of relationship 3=18574
- and electron density, 1000 km, from top-side ionograms 3=11421
- electron precipitation, energetic 3=9117
- flare-storm time delays, effect of pre-storm conditions 3=700
- forecasting, by h.f. signal strength, trans-polar 3=16303
- great, main phase 3=25947
- hydromagnetic theory 3=7001
- hydromagnetic theory and current systems 3=13842
- and ionosphere, absorpt., 26.6 Mc/s, high latit., sudden commencement 3=13737
- and ionosphere current systems motion 3=13836
- and ionosphere, sporadic E 3=21059
- and ionosphere sporadic E and auroral disturbances 3=18535
- ionospheric disturbances, WWV reception in the Arctic 3=11433
- ionospheric effects of storms and giant pulsations 3=13708
- lunar and planetary influences 3=25962
- M-region, rel. to solar-wind turbulence 3=23651
- main phase development 3=11469
- main phase and polar magnetic substorms, simultaneous development 3=21076
- micropulsations, hydromagnetic 3=25948

Magnetic storms—contd

- microstorms, rel. to impedance transfer concept 3=13838
- northern—southern hemispheres correl. 3=1491
- due to nuclear explosion, megaton, 320 km 3=9133
- plasma streaming in mag. dipole field, theory 3=16935
- polar disturbances, effect of extra-terrestrial particle streams 3=13630
- rapid fluctuations, spatial distrib. 3=1487
- rel. to F-region changes 3=18539
- relationship with ionospheric variations 3=13707
- relationship with ionospheric variations 3=13759
- relationship with ionospheric variations 3=13760
- relationship with ionospheric variations 3=13761
- ring current, main-pulse, generation 3=9131
- SC, rel. to ionospheric radio absorp. in Arctic 3=5874
- SCNA, SEA, due to solar flares 3=23612
- at several earth radii, satellite observations 3=5226
- solar sources, north—south asymm. 3=18631
- solar sources, rel. to solar spottedness asymm. 3=18633
- sudden commencement magnitudes, local time depend. 3=21074
- sudden commencements, Antarctic auroral zone contraction 3=11452
- sudden commencements, effect on auroral green ray 3=11453
- sudden commencements, equatorial enhancement 3=16302
- sudden commencements, hydromagnetic wave polarization 3=25945-6
- sudden commencements, impulses and durations 3=9132
- sudden commencement, rel. to initial cosmic-ray increases 3=17376
- sudden commencement, July 13, 1961, rel. to radiation intensity increase 3=11471
- sudden commencements, morphological studies 3=1489
- sudden commencements, origin rel. to plasma streams 3=5227
- sudden commencements, rel. to world wide change equatorial enhancement 3=11470
- sudden commencement, 30 Sept. 1961. rel. to cosmic rays 3=7955
- and sun, active region longitudinal distrib. 3=23689
- sun, disturbances, effects, Nov. 1960 3=18527
- and sun, long-lived filaments, lack of correl. 3=16305
- variations, conjugacy 3=13839
- whistler dispersion correl., variations 3=11410
- Feb., 1958, changes in F2 layer 3=3519
- July 1961, rel. to cosmic ray protons 3=7952
- Sept. 13, 1961, magnetospheric boundary, Explorer 12, obs. 3=18573
- 28 Sept. 1961, rel. to solar flare; particle meas. 3=7953
- Sept. 30, 1961, rel. to outer radiation belt changes 3=21069
- Feb. 1962, rel. to solar protons 3=22225

Magnetism

- See also Antiferromagnetism; Antiferromagnetism; Diamagnetism; Earth, magnetic field; Ferrimagnetism; Ferromagnetism; Gyromagnetic effect; Magnetohydrodynamics; Paramagnetism; Stars, magnetism.
- atomic interactions, use of Dirac vector model 3=18055
- band electrons, spin polarization 3=8646-7
- complex structures, slow neutron scatt., cross-sections and polarization 3=23182
- conference, Pittsburgh (1962) 3=13222
- critical concentrations, Bethe—Peierls—Weiss theory 3=6690
- crystallochemical model for indirect interactions 3=3079
- crystallographic point groups and macroscopic symmetry in space—time 3=23366
- crystals, spin—spin interact., theory 3=12935
- crystals, symmetry considerations 3=13233
- cylindrical thin films, magnetization calc. 3=21928
- Dirac monopole, rel. to parity in e.m. interact. 3=22054
- electric cond. tensor of interacting particles system 3=8482
- electron gas, spin density waves 3=2772
- exchange interactions in magnetic crystals 3=15724
- flux density, source equation 3=12282
- Hartree—Fock meth., unrestricted validity, Harwell, review 3=978
- heat cond. near transition point, spin—phonon theory 3=20121
- helical mag. structure, scatt. of polarized neutrons, calc. 3=6718

Magnetism—contd

- hollow cylinders, magnetic flux quantization 3=16859-60
- hyperfine interaction transferred, in magnetic complexes, corr. terms. 3=978
- interaction between two atoms, review 3=3090
- lines of induction, rel. to $\text{div } \vec{B} = 0$ 3=19395
- magnetic and acoustic excitation of spin system 3=11021
- magnetic disorder neutron scattering meas. technique 3=1101
- magnetic monopoles, parity violation 3=21205
- magnetic space groups; tables 3=1100
- magnetoelectric media, tensor relns. and wave propag 3=2855
- magnetostatic energy, macroscopic; microscopic basis 3=2089
- metals, localized moments, temp. var. 3=15725
- metals, magnetic order, rel. to electron-band structure 3=15406
- metals, review, particular reference to Frenkel's early work 3=22888
- metals, surface props. from ortho—para H conversion 3=1128
- moments calc. from vertical component of mag. field 3=2086
- neutron magnetic inelastic scattering 3=1116
- polarization of ferromag. nuclei in paramag. or diamag. crystals 3=6686
- rare earth metals, 4f shells, indirect interact. 3=3076
- rare-earth metals, heavy, Fermi surfaces and spin structures 3=22687
- rare-earth metals, hyperfine interactions 3=15954
- relation to superconductivity 3=14442
- relaxation, Green's function theory 3=15726
- single-domain particles, thermal fluctuations 3=15727
- solids, Ising model, time-dependent 3=14045
- spin config. changes in mag. field, theory 3=25499
- spin particles, diffusion in magnetic field 3=23134
- spin relaxation, Fokker—Planck eqn. 3=1623
- spin resonance saturation, statistical theory 3=5378
- spiral structures, effect of anisotropic field 3=3075
- superconducting films, theories 3=14443
- susceptibilities of aliphatic C—C and C—H bonds 3=2636
- teaching demonstration, inverse-square law 3=5803
- tensor symmetry, 4 kinds, and anisotropy energy 3=13223
- two-spin system, relaxation, theory 3=1624
- transition metals and alloys, permanent moments 3=2755

Magnetization process

- See also Ferromagnetic relaxation.
- absorpt. of a.c. field, longit., in ferromag. dielectric 3=8662
- absorpt. of a.c. field, non-reson., in ferromag. dielectric 3=8661
- adiabatic demagnetization, susceptibility, meas., by recording fluxmeter 3=14709
- Alumel, hysteresis loops, eddy-current broadening 3=15790
- antiferromagnetic, longitudinal mag. 3=6731
- antiferromagnets, adiabatic magnetization cooling effect 3=15909
- antiferromagnets, adiabatic theory 3=3143
- coercive field, statistical theory 3=1089
- conducting ferromagnetics, magnetization changes and losses 3=15768
- deformed anisotropic media, magnetization eqn. of motion 3=15774
- demagnetizing energy, uniformly magnetized cube 3=9899
- demagnetizing factor rel. to magnetization and susceptibility 3=11064
- domain structure behaviour during magnetization 3=25531
- domain wall motion, dynamics 3=15797
- even effects, anisotropy, in orthorhombic and rhombohedral lattices 3=23166
- ferrite, demagnetization, mag hysteresis role 3=8692
- ferrite memory cores, history, effect on switching 3=15869
- ferrite, memory cores, multipath, flux switching 3=15870
- ferrites, hysteresis loops rel. to creep 3=8688

Magnetization process — contd

- ferrites, magnetization wave produced by e.m. wave 3=4269
- ferrites, rotational magnetization reversal 3=15865
- ferrites, square-loop, magnetization reversal 3=13275
- ferromag. thin films, spontaneous, and coercive force, meas. 3=6710
- ferromagnet, Barkhausen noise intensity rel. to elastic stress, heat treatment and crystal structure 3=3104
- ferromagnetic films, hysteresis meas. 3=24424
- ferromagnetic films, impulsive magnetization 3=15848
- ferromagnetic films, spontaneous magnetization 3=25533
- ferromagnetic films, switching, high field 3=15825
- ferromagnetic rotl. hysteresis 3=4239
- ferromagnetic small particles, spontaneous, theory 3=3113
- ferromagnetic thin films 3=8674
- ferromagnetics, effect of mech. deform. 3=13247
- ferromagnetics, uniaxial fields perpendicular to preferred direction and parallel to Bloch walls, calc. 3=15796
- films, ferromag., freq. var., from Kerr magneto optical effect 3=25536
- films, high-speed magnetization reversal, direct obs. method 3=14711
- films, magnetostatically coupled, calc. 3=13258
- Heisenberg ferromagnet, const. coupling approx., thermodynamical fluctuation decay 3=23145
- hysteresis loops, asymm., effect of tension 3=6705
- increase rel. to high fields 3=6706
- initial magnetization and hysteresis cycles rel. to temp. 3=1088
- initial susceptibility relations 3=13225
- memory wires, "distrib" thresholds 3=15849
- paramagnetic term, parasitic, one-dim. theory 3=25511
- Permalloy films, effect of surface roughness 3=15840
- Permalloy films, flux reversal by Neel wall motion 3=15845
- Permalloy, films, hysteresis 3=15837
- Permalloy films, rel. to dispersed anisotropy 3=15811
- permalloy films, torque, angular dependence 3=1071
- Permalloy films, transverse 3=18087
- Permalloy (94%Ni) and pure Ni, differences rel. to stress & temp. 3=1142
- permanent effects due to repeated impacts 3=3099
- pyrrhotite, TRM and IRM, field depend. 3=11063
- rare-earth metals, saturation rel. to temp. 3=25525
- refrigeration by adiabatic demag., theory 3=14431
- rel. to magnetization stability 3=11060
- reversal nucleation around dislocations, model 3=5009
- "rotational" coercivity of isotropic ferromagnetics 3=8667
- saturation approach, effect of deformation 3=8669
- spin screw system 3=976
- spontaneous mag., effect of lattice oscill. 3=1131
- spontaneous mag. near Curie point, effect of lattice oscill. 3=1132
- steel, hysteresis anisotropy, effect of stretching 3=20578
- steel, Type E310, on heat treatment, mag., effect of field 3=20584
- superconducting alloys, near 2nd critical field 3=24141
- superconductors, hard, size effects, and crystal imperfections, theory 3=19099
- surface effect for nonsinusoidal field 3=18078
- thermoremanent, inversed type, production 3=11065
- viscous, rel. to theory of single-domain grains 3=3117
- yttrium ferrites, initial permeability, var. with freq., temp., garnet struct. 3=6723
- Ag-Mn alloy, ferromag.-antiferromag. model 3=20585
- BaFe₁₂O₁₉, nucleation around dislocations, model 3=5009
- CoCO₃, hexagonal anisotropy and magnetization curves 3=18112
- Co-Cu, dilute alloys, hysteresis 3=5028
- CoFe₂O₄, films, hysteresis 3=15655
- Co(H₂O)₆SiF₆, adiabatic demagnetization 3=1059
- Cu-Co alloys, blocking process by volume development 3=1096
- Cu-Mn alloy, ferromag.-antiferromag. model 3=20585
- Dy ethyl sulphate, demagnetization expts. 3=1056
- Fe films, coercive field, hysteresis 3=15810

Magnetization process — contd

- Fe films, easy axis reversal 3=11087
- Fe films, jumps, magnitude distrib. 3=20599
- Fe films, 1500-2000A, large Barkhausen jumps 3=11080
- Fe films, rel. to thickness 3=3109
- Fe, hysteresis loops, eddy-current broadening 3=15790
- Fe, one-domain particles, coercive force and remanence 3=11088
- Fe particles, in Hg, coercivity, effect of other metals 3=15773
- Fe, saturation induction, increase by H absorption 3=1145
- Fe, spontaneous moment variation, 1.4° to 5°K 3=15792
- Fe-Co, one-domain particles, coercive force and remanence 3=11088
- Fe-Ni alloys, effect of uniaxial tension and compression 3=3102
- Fe-Ni, ordered, easy mag. axis 3=8900
- Fe-Ni, saturation rel. to volumetric compression 3=8668
- Fe-Ni-Mo films, 1500-2000A, large Barkhausen jumps 3=11080
- γ-Fe₂O₃, fine particles for recording media, coercivity and remanence curves 3=1091
- Fe₂O₃, TRM and IRM, field depend. 3=11063
- Fe₂O₄, TRM and IRM, field depend. 3=11063
- Fe-Si, diffusion after-effect 3=8660
- Fe-Si(3%), Néel theory, temp. var. 3=20586
- Fe-Si sheets, reptation and bascule effects 3=23158
- GdCl₃, magnetocaloric effects 3=15803
- In-2 $\frac{1}{2}$ % Bi, superconductor rel. to field strength 3=3954
- Li ferrite, square-loop props., effect of grain size 3=15876
- LiNiZn ferrites, square hysteresis loops 3=15866
- LuFe garnet, square hysteresis loops 3=15868
- MgFe₂O₄, TRM and IRM, field depend. 3=11063
- Mg-Mn ferrite cores, square-loop, flux reversal 3=1084
- MgMn ferrite, hysteresis loops, rectangularity 3=13272
- MgMn ferrites domain wall motion inhibition 3=15872
- Mn ferrite, impulse behaviour, effect of induced anisotropy 3=15893
- MnBi, mag. switching rel. to particle size 3=13251
- MnBi, microcryst. particles, reversal processes 3=8657
- MnBi, nucleation around dislocations, model 3=5009
- MnBr₂·4H₂O, adiabatic magnetization, cooling effect 3=15900
- Mn₂Ge₂, anomalies 3=15775
- Nb, rel. to superconductivity 3=11066
- Nb₂Al, hysteresis loops, rel. to superconductivity 3=14455
- Nb₂Sn, hysteresis loops, rel. to superconductivity 3=14455
- Ni alloys, curves after demag., stress effects 3=11061
- Ni chromite, magnetization rel. to orientation 3=1011
- Ni ferrite, memory core, magnetization reversal 3=15874
- Ni, jumps, measurement 3=8664
- Ni, rotational hysteresis, rel. to cold rolling and recrystallization 3=18076
- Ni, spontaneous moment variation, 1.4° to 5°K 3=15792
- Ni wires, thin, from magnetoresistance meas. 3=1087
- Ni-Cr alloys, 0°-300°K, up to 15 kOe 3=5010
- Ni-Cu alloys, 0°-300°K, up to 15 kOe 3=5010
- Ni-Fe alloys, small-signal behaviour, domain wall model 3=25528
- Ni-Fe films, rel. to internal stresses 3=20595
- Ni(80%)-Fe(20%) films, reversal 3=1082
- Ni-Fe thin films, reversible rotation by Faraday effect 3=1079
- Ni-Fe thin films, switching by non-coherent rotation 3=1081
- Ni₂Fe₂O₄, films, hysteresis 3=15655
- NiFe₂O₄, nonstoichiometric, constricted hysteresis loop 3=1085
- Ni films, rel. to temperature 3=15821
- Ni-Mn alloys, 0°-300°K, up to 15 kOe 3=5010
- Ni-Mn, saturation rel. to volumetric compression 3=8668
- Ni₂Mn, temp. depend., antiferromag. exchange interaction 3=20583
- NiZn ferrite, irreversible stress effects in Raleigh region 3=8690
- Ni-Zn ferrites 3=20336
- Si-iron, rel. to field and external stresses 3=8663

Magnetization process—contd

- Si—Fe, eddy-current losses, calc. from domain wall data 3=15800
 3% Si—Fe, initial mag. curve, tension effects 3=25527
 V, electronic and nuclear polarization by slow neutron scattering 3=18057
 V₃Ga, hysteresis loops, rel. to superconductivity 3=14455
 V₃Si, hysteresis loops, rel. to superconductivity 3=14455
 V₃Si, 6.1×10^{-3} cms, magnetization 3=8677
 YFe ferrite, rotational magnetization reversal 3=15873
 YFe garnet, square hysteresis loops 3=15868
 YFeO₃, TRM and IRM, field depend. 3=11063
 YI garnet, TRM and IRM, field depend. 3=11063

Magnetization state

- anisotropy, effect on spin—wave spectrum 3=20579
 anisotropy, review of Soviet work since 1958 3=1135
 Bloch wall energy, meas. 3=15802
 demagnetization, apparatus for 3=19398
 demagnetized state, n.m.r., expt. and theory 3=6760
 domain config. and movements, X-ray topography 3=5011
 domain structure behaviour during magnetization 3=25531
 domain structure, effect of external fields 3=8671
 domain structure, magneto-optic study, contrast variation 3=14712
 domain structure, short review 3=11070
 domains, ferromag., obs., colloidal, magneto-optic 3=23161
 domains, ferromagnetic, loosely-coupled, switching threshold calc. 3=13249
 domains, structure of Bloch walls 3=15793
 ferrite hollow cylinder, magnetostatic oscillations 3=3131
 ferrites, increase rel. to (Ni²⁺ + F⁻) conc. 3=1013
 ferromag. crystal, uniaxial, domain structures 3=3105
 ferromag. domain structure, study by Kerr meridional rotation 3=23162
 ferromagnetic cylinder, nucleation field, upper and lower bands 3=23150
 ferromagnetic domains, microscope study 3=20589
 ferromagnetic films, domain boundaries, mag. fields effects 3=20594
 ferromagnetic films, surface anisotropy effects 3=25535
 ferromagnetic materials, with anisotropy in spectroscopic-splitting effective factor 3=3100
 ferromagnetic prism, square, nucleation fields 3=15771
 ferromagnetics, in Rayleigh region, characteristic magnitudes 3=3108
 films, anisotropy, angular and magnitude dispersion 3=11083
 films, domain wall motions, electron micros. photography 3=23167
 films, ferromagnetic, rel. to pinning of surface spins 3=15838
 films, Néel wall thickness, quantum theory 3=5015
 films, 90° curling of magnetization 3=15834
 magnetic symmetry in mag. crystals 3=15732
 magnetite, domain structure 3=9138
 mixed ferromagnetic and ferroelectric phase 3=23147
 Permalloy, films, anisotropy 3=15837
 Permalloy films, anisotropy dispersion and error function 3=20601
 Permalloy films, anisotropy, rel. to prep. conditions 3=11086
 Permalloy films, domains, evaporated on cleaved NaCl 3=20931
 Permalloy films, spin pinning at surface 3=15839
 Permalloy (78,83) films, anisotropy, 1 Mc/s 3=15828
 permeability, initial, wall dimension effects 3=3123
 remanent mag., hydrostatic pres. effects 3=23156
 rock magnetism, new magnetometer 3=9905
 "silicon steel", stability rel. to demagnetization 3=11062
 spheroidal crystal, uniaxial 3=1118
 spin-wave instability in microwave field parallel to d.c. field, theory & application 3=1051
 stability, rel. to magnetization process 3=11060
 steel, domain boundary layers 3=25530
 steel, domain width, var. with grain size and Si content 3=10727

Magnetization state—contd

- steel, with 3% Si, domain structure, effect of elec. field and ferrite stress 3=15861
 surface microfields on ferromagnetics, electron mic. meas. 3=2075
 thin ferromag. films, parallel, magnetization distrib. 3=3110
 Al—Fe films, evaporated, anisotropy and Al source position 3=18084
 Au—Co (1.57 wt.%), anisotropy, on cold rolling 3=20580
 BaFe₁₂O₁₉, domain structure, microscope study 3=20589
 Co, domain boundary layers 3=25530
 Co, epitaxial films, domain structure 3=15830
 Co, f.c.c. films, 1000 Å, ferromagnetic domain 3=20605
 Co, films, domain structure 3=8676
 Co films, spin pinning at surface 3=15839
 Co powder, n.m.r. of nuclei in Bloch walls 3=3193
 Co, rel. to longitudinal n.m.r. model 3=3197
 Co, surface domain structure, by powder method 3=23164
 CoFe₂O₄ (ferrite), magnetic domain structure 3=11098
 CrBr₃, domain structure, light-diffraction study 3=11072
 Cr—Fe alloys, average mag. moment 3=11055
 Fe, anisotropy of wires under small torsion 3=20577
 Fe, epitaxial films, domain structure 3=15830
 Fe films 3=20600
 Fe films, mag. distribution 3=18091
 Fe, polycrystalline, domain sizes meas. 3=11074
 Fe powder, external mag. field effect on n.m.r. 3=1203
 Fe, rel. to longitudinal n.m.r. model 3=3197
 Fe—Al films, evaporated, anisotropy and Al source position 3=18084
 Fe—Ni alloys, f.c.c. and b.c.c., rel. to composition 3=8670
 Fe—Ni—Mo alloy, films 3=20600
 α-Fe₂O₃ (haematite), domain structure, neutron scatt. study 3=15859
 Fe—3%Si, Bloch wall energy 3=15802
 Fe—3%Si, domain structure, effect of compression 3=13263
 Fe—Si (4%), domain wall velo., effect of plastic deformation and irradiation 3=11068
 FeTiO₃—Fe₂O₃, reverse thermoremanent 3=1496
 Gd, domains, -5°C, Bitter patterns, wall movement 3=18081
 Gd, magnetocrystalline anisotropy 3=1143
 Mn ferrite 3=15890
 Mn ferrite anisotropy, induced uniaxial, effect on impulse behaviour 3=15893
 Mn ferrites, domains study by Kerr effect 3=13276
 MnAs, 3°C and 35°C anisotropy 3=15753
 Mn₂Ge₃, domain struct., near Curie temp. 3=13250
 Ni alloys, dilute, mag. moment distrib., neutron scatt. study 3=15858
 Ni, anisotropy of wires under small torsion 3=20577
 Ni, domain boundary layers 3=25530
 Ni, domain structure, effect of dislocations 3=11059
 Ni, domain, temp. var., magneto-optical obs. 3=23165
 Ni, domain wall velo., effect of plastic deformation and irradiation 3=11068
 Ni, domain walls, effect on mech. props. 3=3209
 Ni, epitaxial films, domain structure 3=15830
 Ni ferrite, initial permeability, effect of wall dimensions 3=3123
 Ni ferrites, anisotropy prod. by rotary field tempering 3=15892
 Ni, films, domain structure 3=8676
 Ni films, domains, evaporated on cleaved NaCl 3=20931
 Ni powder, domains, from n.m.r. field-frequency curve 3=17393
 Ni, rel. to longitudinal n.m.r. model 3=3197
 Ni thin films, rel. to cathodic H 3=1075
 Ni ultrathin films saturation and anisotropy 3=15822
 Ni—Co alloys, domain patterns, rel. to composn. 3=18079
 Ni—Cu (30%), domain wall velo., effect of plastic deformation and irradiation 3=11068
 NiF₂, spin waves and n.m.r. in domain walls 3=18114
 Ni—Fe, electrodeposited films, domain structure 3=11085
 Ni—Fe films, domain walls 3=15829
 Ni—Fe films, spiral and concentric domain walls 3=15846
 Ni₂Fe, anisotropy, on annealing 3=23155

Magnetization state — contd

- Ni-Fe (80/20%) films, ultrasonic switching 3=15826
- Ni-Fe, single crystals, anisotropy, magnetoelastic, temp. depend. 3=18075
- Ni-Fe-Co alloys, mag. wall-wall interaction between films 3=15833
- Ni₃Mn superlattice, rel. to order 3=18080
- NiO, antiferromagnetic T'-domain walls 3=20622
- NiO, multiple twin domains and domain walls 3=1146
- NiZnCo ferrites, elastic stress depend. 3=20614
- Si (3.5%)-Fe, domain structure, 0-600°C, from longitudinal Kerr effect 3=11071
- Si-Fe, domain walls, rel. to eddy-current losses 3=15800
- Si-Fe, domains, band structure 3=1147
- V-Fe alloys, average mag. moment 3=11055
- YFe garnets, spontaneous magnetization temp. var. 3=6721

Magnetoacoustic effects

- amplification, acoustic, crossed elec., mag. fields, giant quantum osc. 3=20094
- Corbino expt. using cylindrical mag. field 3=1925
- crossed excitation, rel. to nuclear and electron spin nonequilib. states 3=5384
- Fermi surface mapping resonance method 3=17680
- ferrimagnetic single-crystal ellipsoid, longitud. pumping of magnetoelastic waves 3=15898
- ferrimagnetic single crystals, ordered, unstable phonon growth at microwave freq. 3=15897
- ferroacoustic spin-wave resonance in films 3=23174
- fluids, conducting, magneto-sonic wave excitation 3=17037
- metals, quantum, rel. to electron spin 3=15429
- metals, resonant damping of u.s. spiral waves 3=20089
- metals, u.s. absorption in e.m. field 3=2722
- noble metals, to 350 Mc/s, Fermi surface dimensions 3=2759
- plasma cylindrical column waves 3=7545
- plasma, cylindrical, resonance 3=397
- plasma, nonequilibrium, effect of mag. field excitation 3=21843
- plasma, resonance, high field amplitude 3=21831
- plasma, resonance, mag. fld. amplification 3=7544
- plasma, thermal, absorpt. of magnetoacoust. waves 3=24327
- plasma waves, effects of particle collns. 3=4126
- plasma waves, theory 3=16958
- semiconductor, plasma, pinched, moving, Doppler effect, e.m. waves 3=17827
- sound amplification by cond. electrons, mag. field depend. 3=25194
- sound and e.m. wave transformation at conductor boundary, in magnetic field. 3=208
- spin system, two-pulse effects 3=11021
- tensor field invariants and expt. 3=17811
- use for underwater sound prod. 3=14256
- Ag, effect of field on velocity of sound 3=8356
- Al, effect of field on velocity of sound 3=8356
- Al, Fermi surface meas. 3=17682
- Al, oscillation anisotropics at 4.2°K 3=22685
- Al, resonance at 4.2°K 3=6469
- Au, effect of field on velocity of sound 3=8356
- Cd, Fermi surface deduction 3=22686
- Cu, effect of field on velocity of sound 3=8356
- EuFe garnet, magnetelastic coupling constants 3=15886
- Ga, oscillation 3=10592
- In, meas. up to 270 Mc/s 3=6472
- Pb, in longitudinal fields 3=25192
- Pb, meas. up to 270 Mc/s 3=6472
- in Pb, oscillations 3=4819
- Sn, in longitudinal fields 3=25192
- Sn, white, rel. to Fermi surface 3=15469
- Ta, effect of field on velocity of sound 3=8356
- TbFe garnet, magnetoelastic coupling constants 3=15886
- Tl, and Fermi surface, erratum 3=10629
- Tl, Fermi surface meas. 3=20132
- V, effect of field on velocity of sound 3=8356
- YFe garnet, ferro-acoustic resonance 3=11129
- YFe garnet, magnetoelastic interaction 3=15889
- YFe garnet, magnetoelastic interactions in parallel pumping 3=15884
- Zn, meas. rel. to electron structure 3=10623

Magnetoelectric effects

See also Hall effect; Magnetoresistance.

- antiferromagnetics, spin-orbit statistical theory 3=4900
- in antiferromagnets 3=15529
- antiferromagnets, rel. to domains 3=834
- atmosphere, upper, waves, freq. cut-off 3=16304
- crystals, semiconductor, calc. 3=6565
- crystals, tetragonal, ellipsoidal models 3=25317
- Fermi surface in form of a net; open electronic orbits in mag. fld. 3=2754
- ferromagnetic films, resonances 3=23174
- ferromagnetic massive metal and thin films, elec. res. rel. to mag. fld. 3=6710
- field-dependent tensors, symmetry 3=11
- galvano-thermomagnetic energy-conversion density 3=356
- galvano-thermomagnetic energy conversion devices 3=9716
- galvano-thermomagnetic energy converters, anisotropic materials 3=21695
- helicon oscillations, classical theory 3=10728
- ionic crystals, polar scatt. of electrons 3=15464
- magnetoelectric media, tensor relns. and wave propag. 3=2855
- metal contact, tunnel current, quantum oscill. in mag. field 3=22908
- metals, liquid, theory and expt., review 3=21401
- metals, meas. at low temp. and high pressures 3=24158
- Nernst generators, anisotropic and adiabatic 3=21694
- nonmagnetic and ferromag. metals, compensation effects 3=25330
- qualitative behaviour rel. to Fermi surface 3=10713
- review of Soviet work since 1958 3=1135
- semiconductors, calc., use of resistance network 3=13050
- semiconductors, dislocations, elec. props. 3=25335
- semiconductors, impurity ion transport in mag. field 3=6570
- semiconductors, theory 3=6576
- transverse electrical conductivity rel. to electron and phonon mutual dragging 3=4901
- AgBr, rel. to polar scatt. of electrons 3=15464
- AgCl, rel. to polar scatt. of electrons 3=15464
- Al, anisotropy in strong fields at 4.2°K 3=22903
- Al, helicon oscillations det. 3=10728
- Bi crystal, microwave-induced d.c. voltage 3=2856
- Bi, Shubnikov-de Haas effect 3=15586
- Bi₂Te₃, anisotropy 3=10804
- Bi₂Te₃, valence band structure meas. 3=25240
- Cr₂O₃, magnetization induced by elec. field 3=15739
- Cr₂O₃, magnetization induced by elec. field 3=15740
- Cr₂O₃, powder, after magnetoelec. annealing 3=13027
- Cr₂O₃, spin-orbit statistical theory 3=4900
- (Cr₂O₃)_{0.8}(Al₂O₃)_{0.2}, magnetization induced by elec. field 3=15740
- Cu, helicon oscillations det. 3=10728
- Ga, low-field, at 77°K 3=13044
- Ge bicrystal boundary layers 3=22927
- Ge, injected plasma oscillations 3=25257
- HgSe, rel. to dispersion and effective mass 3=870
- HgTe, rel. to dispersion and effective mass 3=870
- In, helicon oscillations det. 3=10728
- InSb, n-type 3=17882
- InSb, n-type, effects of r.f. radiation 3=6634
- InSb, p-type, rel. to valence band and hole scatt. 3=22947
- Mn alloys, Brillouin zone effects on elec. cond. 3=20554
- α-Mn, mag. Brillouin zone effects 3=20555
- Ni, high-field meas. 3=25330
- Sb, pure and Sn-doped, analysis 3=8513
- SnTe, rel. to temp. 3=10841
- Te, galvanomag. coeffs. at 4.2°K 3=835
- Te, valence band structure 3=22953
- TiO₂ 3=25369
- Zn, Fermi surface, magnetoelec. data 3=12945
- Zn, by He temps. meas. 3=8492

Magnetohydrodynamics

See also Plasma oscillations.

- a.c. induction MHD generator 3=9925
- A plasma, insulating-boundary thickness behind shocks 3=24456
- absolute spatio-temporal form of equations 3=21960
- aero-magneto-flutter 3=24449-50

Magnetohydrodynamics—contd

- Alfvén's waves, instability 3=5822
 analytic methods and approximations 3=21954
 anisotropic, plasma, equations, correction 3=21955
 axisymmetric system of charged particles 3=14756
 basic eqns. and mag. Reynolds number 3=5827
 bibliography 3=12098
 boundary-layer equations, thin plate problem 3=21959
 boundary layer growth of an infinite flat plate 3=4258
 Carnot engine with thermally ionized gas as working fluid, energy obtainable 3=5558
 channel flow, boundary conditions 3=24457
 channel with tensor elec. cond., segmented electrodes, end losses 3=9924
 charged particle accel., energy spectra 3=21087
 charged particle collision integral in mag. fld. 3=5829
 charged particle motion in slowly varying fields, first order approx. 3=21941
 charged particles in gas, diffusion waves 3=21956
 charged particle, three-dimensional containment by orthog. standing waves 3=19428
 combustion, in piston-driven medium 3=4262
 combustion, with motionless piston 3=2116
 compressible fluid with variable entropy, flows 3=2118
 conducting gas escape into region with magnetic field 3=12301
 conference, engineering aspects, Rochester 1962 3=2095
 convection, rot. effects 3=21585
 convection stability, liquid heated from below 3=16591
 current-carrying fluid jet from nozzle instability 3=21950
 cylinder in moving plasma, static potl. 3=7533
 cylinder, nonideally conducting, stability 3=24454
 detonation waves, structures 3=4254
 detonation, with motionless piston 3=2116
 dielectric semi-space, magneto-elastic and plastic wave propag. 3=5824
 direct conversion of electricity, appl. 3=5618
 discontinuities, stability, relativistic theory 3=4261
 e.m. fluctuations in plasma with and without magnetic field 3=417
 elastic Rayleigh waves in a dielectric in a mag. field 3=19435
 electric charge and m.h.d. wave motion in fields with cylindrical and toroidal symmetry 3=24442
 electricity generators, thermodyn. and gas-dynam. 3=4001
 electromagnetic radiation, plasma, effect on charged particle motion 3=16946
 electron plasma in magnetic field, dielectric permeability tensor, quantum theory 3=402
 electrons, bound, magneto-ionic theory 3=17062
 energy conversion process, plasma diode model 3=21816
 equations applied to stability studies, Lagrangian formulation 3=12303
 equilibria, proper coordinate systems 3=12192
 equipartition state perturb., tensor virial approx. 3=9913
 exosphere, isotropic wave propag., models 3=1474
 expansion of piston into ionized medium in mag. field 3=21776
 field mode concept for linearized fields 3=9922
 films, steady, gas, substitutional principle 3=14748
 flow, at low conductivity, linearized problem 3=2103
 flow in annular channel 3=7685
 flow bet. infinite disks, one rotating 3=478
 flow between non-cond. porous plates for mag. field at mag. Prandtl no. 1 3=24447
 flow bet. parallel plates, normal mag. field 3=24443
 flow between torsionally oscill. parallel plates 3=4257
 flow between two non-parallel porous walls 3=7689
 flow due to rotating disk 3=479
 flow, gas, between coaxial cylinders with potential between 3=17044
 flow, gas, with radiation 3=19425
 flow, laminar, entry problem equations, stability errors 3=19432
 flow past a rotating magnetized sphere 3=14570
 flow past semi-infinite plate, transverse 3=2105
 flow, past thin wave-shaped plate 3=14749
 flow round thin profiles 3=19426
 flow past semi-infinite plate, boundary layer 3=14753-4-5

Magnetohydrodynamics —contd

- flow of a viscous, incompressible, weakly conducting fluid around a mag. sphere 3=17035
 flow, round flat vanes, normal and parallel to field 3=21962
 flows, elliptic—hyperbolic transition regions 3=480
 flows, relativistic, compressible, intrinsic equations 3=9915
 flow, incompressible two-dim., gen. theory 3=2102
 flow, laminar free convection, of elec. cond. fluid 3=2114
 flow past thin foil 3=2096-7
 flow, temperature instability 3=9918
 fluid, conducting, motion past fixed body, aligned mag. field present 3=24448
 fluid flow past plane wall containing mag. dipole 3=12302
 fluid sphere, oscill. about equipartition state 3=9912
 fluid, turbulent conducting, large Prandtl number, weak mag. fld. growth 3=17038
 fluids, charged, surfaces, with finite conductivity, in general relativity 3=18714
 force-free mag. fields, stability, appl. to spiral galaxies 3=5825
 free jet flow, study 3=17040
 gas, conducting, radial flow in crossed fields 3=12306
 gas discharge, current channel formation in weak field 3=1858
 gas-dynamic flow with shock waves 3=12305
 gas flow, moment eqns. and boundary conditions 3=5821
 generator, Hall effect, one-dimensional flow analysis 3=14760
 generator using combustion gases as heat source 3=2117
 generators, basic equations 3=7692
 generator for direct conversion of thermal energy 3=14759
 generators, nonequilibrium ionization 3=4263
 geomagnetic storms, theory 3=7001
 geometrical, small disturbance propagation in inf. cond. perfect, compressible medium 3=9917
 gravitating liquid cylinder, stability, rel. to nonsymm. oscill. 3=482
 gravitating plane layer, with exp. density decay 3=2112
 gravitational instability of compressible medium 3=9156
 gravitational instability in nonuniform mag. field 3=9154
 gravity waves in horiz. mag. field 3=4260
 Hall effect generator, flow, one dimensional theory 3=17045
 heat transfer bibliography 3=7364
 heating of upper atmos. 3=25919
 Helmholtz instability, Coriolis force effects 3=2099
 hodograph for two-dimensional flow 3=21963
 hydromag. capacitor, flow of incompressible fluid 3=7687-8
 hydromagnetic fields, separately stable, joint instability 3=17039
 hydromagnetic waves in ionosphere 3=13742
 hypersonic flow past wedge 3=24451
 hypersonic shock wave, m.h.d. supported 3=18901
 infinite fluid, generation by vortical current rings 3=477
 inviscid fluid flow, transverse mag. field 3=24458
 ionized gas cloud acceleration with electron flux scattering 3=2113
 ionized gases, low density, in axially symmetric mag. fields 3=19182
 ionosphere, wave motion, three-fluid theory 3=16250
 instabilities in multipolar systems 3=21949
 instability, vibrational convection, theory 3=5830
 interplanetary plasma flow round earth 3=9287
 inviscid fluid, rel. to electrodynamics 3=9921
 ionization diffusion in dipole field 3=23607
 ionizing waves, rel. to plasma prodn. 3=7684
 ionosphere, and explosion, nuclear, high-altitude, mag. var., short time delay 3=23616
 ionosphere, wave attenuation, theory 3=9074
 isotropic turbulence spectrum, response to mag. field 3=21952
 jet of fluid in transverse mag. field 3=12299
 Kelvin—Helmholtz discontinuity, stability 3=21948
 laminar boundary-layer equations at low magnetic Reynolds number 3=4259

Magnetohydrodynamics—contd

- laminar flow in rect. channel, porous walls 3=9920
- linearized, covariant treatment 3=21953
- linearized three-component theory 3=9923
- lines of force, boundaries 3=5823
- liquid conductor falling in mag. field, stability 3=7686
- liquid instability, energy transform. near. mag. neutral line 3=5826
- liquids, rotating, wave theory 3=9919
- lubrication by cond. lubricant in mag. field 3=24446
- m.h.d. generator, electron heating in Hall fields 3=24459
- m.h.d. generator, elevation of electron temp. 3=24460
- m.h.d. generator, stability, electron-temp. rise 3=24272
- magnetic annular shock tube, deviation from one-dimensional model 3=2100
- magnetoacoustic waves, attenuation, anisotropic relativistic case 3=24453
- magneto-acoustic waves, reflection and refraction at interface 3=19433
- magnetogasdynamic flow, one-dimensional, with wall friction 3=19431
- magnetogravitational instability of rotating medium 3=9159
- magneto-sonic wave excitation, fluids, conducting 3=17037
- motion of non-cond. sphere in cond. fluid 3=19429
- motion of sphere in cond. fluid in mag. field 3=19430
- motion of a spherical fluid mass, with circular current lines in parallel planes 3=24441
- non-isothermal plasma, single-fluid eqns. 3=4126
- one-dimensional analysis of steady flows in Faraday and Hall-type channels 3=14752
- orbits, non-adiabatic, in cusped magnetic field 3=12193
- oscillations, bet. two vertical, parallel, infinite planes of a dense, viscous fluid 3=9916
- oscillations of cond. fluid layer, resonance effects 3=24455
- oscillations of cond. liquid in U-tube in mag. field 3=12298
- paramagnetic gas in magnetic field. 3=171
- paramagnetic particle motion in a fluid in a magnetic field 3=17036
- plane and axisymmetric stationary gas flows 3=19434
- plasma in a.c. field, transport coeffs. 3=9774
- plasma beam, ion and electron, neutralized, mag. barrier penetration, calc. 3=19423
- plasma, cond. and electron relax. rel. to radiative effects 3=5671
- plasma conductor, forced convection 3=21777
- plasma, current induced by mag. field 3=1974
- plasma diffusion theory 3=403
- plasma electrons, effective collision frequencies and ω_{pe} values 3=1977
- plasma flow, almost one-dim. 3=7514
- plasma motion, Lagrangian and Hamiltonian formulations 3=12194
- plasma particle distrib., theory 3=5669
- plasma, quasi-one-dimensional flow 3=21791
- plasma stability rel. to mag. surfaces 3=1975
- plasma, toroidal stability 3=16949
- plasma, torus, elliptical, equilibrium, magnetohydrodynamic 3=19258
- plate disturber 3=19436
- power generation, a.c. 3=7693
- power generation, conference 3=21966
- power generation, review 3=5833
- power generator, permanent insulating duct walls 3=5832
- Rayleigh-Taylor instability, development of 3=24445
- Rayleigh-Taylor instability, effect of vertical mag. field 3=9914
- refraction, gas, non-uniform mag. field 3=17043
- relativistic, equations 3=4256
- relativistic ideal gas, current vector and mass tensor 3=70
- relativistic ideal gas, current vector and mass tensor 3=1630
- review 3=12297
- rocket propulsion, interplanetary 3=19424
- rotating configurations, virial tensor eqns. 3=4255
- rotating disk, in conducting fluid, effect of weak vertical mag. field 3=14747
- rotating, incompres. fluid, rigid boundary 3=21961
- self-reproducing solns. with axial symm. 3=14757

Magnetohydrodynamics—contd

- semiconductors, fluctuations, electrical carrier motion 3=20280
 - shear layer, heterogeneous, stability 3=2104
 - shock conditions, flow of weakly dissipative fluids, finite conductivity 3=18893
 - shock structure for finite-temp. electrons 3=2106
 - shock wave, collision-free, structure 3=2107
 - shock waves, fast and slow, structure in steady 1-dimens. flow 3=17041
 - shock waves, Fermi accel. of particles 3=9910
 - shock waves in monatomic cond. fluids 3=21965
 - shock waves in plasma, similarity solution 3=7542
 - shock waves in plasmas, mechanisms 3=1973
 - shock waves, width, anisotropic relativistic case 3=24453
 - shocks, evolutionary conditions 3=7691
 - simple wave-weak shock interactions 3=2108
 - solar atmosphere, local equilb. 3=7029
 - sphere, motion in cond. fluid; e.m. phenomena 3=2115
 - spherical vortex, rotating 3=476
 - stability, Rayleigh-Taylor, effect of rot. and mag. field 3=24444
 - stagnation-point flow, transpiration cooling 3=273
 - stationary plasma wave, finite amplitude 3=24280
 - steady-state, with axial symm. 3=14758
 - sun, stability of sub-photospheric tube of force 3=18629
 - supersonic sound, dispersion and absorption 3=3853
 - symmetrical currents 3=19427
 - thermal stability of fluid layer 3=9417
 - thin aerofoil theory 3=12300
 - thin bodies in oblique fields 3=481
 - 3-dimensional flow, perfectly cond. fluid 3=14750
 - toroidal systems of small curvature, equil. and stability 3=12191
 - turbulence in cond. fluid in mag. field 3=21951
 - turbulence, isotropic, energy spectrum theory 3=17042
 - turbulent flow, cond. liquid in rect. tube 3=2098
 - turbulent flow in transverse mag. field 3=21957
 - 2-dimensional flow, non-parallel mag. field 3=14751
 - two-parameter flows, Gromeka and Chaptygin transforms 3=2111
 - vorticity generation by oscillating boundaries 3=5831
 - waves, absorption in plasma, in const. mag. field 3=24283
 - waves, finite amplitude 3=5828
 - waves in geomagnetic field, distant, 1959 52(Explorer 6) obs. 3=9127
 - waves in inhomog. fields of constant direction 3=17034
 - waves in liquid with infinite cond., resonance 3=21958
 - waves, nonlinear 1-dimens. motions 3=24452
 - waves, reflection and refraction at discontinuity 3=12304
 - wave guidance in magnetosphere 3=9942
 - wavy plate in cond. fluid, impulsive motion 3=21964
- Magnetomechanical effects**
- See also Gyromagnetic effect; Magnetostriction.
 - cubic crystals, static magnetoelastic coupling theory 3=6701
 - elastic wave absorption and propag., dynamic elastic moduli 3=25606
 - ferromagnetic insulators, phonon instabilities, excitation by pumping effects 3=23178
 - gyromagnetic ratio detm. 3=467
 - magnetoelastic waves, from cylindrical cavity, reson. amplification 3=18890
 - magnetoelastic waves prop. in conducting semi-space in a mag. field 3=16691
 - magnetothermoelasticity, general two-dimensional problem 3=18762
 - magnetothermomechanics, theory 3=5012
 - plasma, low-pressure, rotational effect 3=21781
 - sphere suspension, torques and Coriolis effects 3=21929
 - vibrations, magnetoelastic, cond. plate and bar in a mag. field 3=16679
 - vibrations, magnetoelastic, cond. plate in a mag. field 3=16680
 - Cr, damping capacity and relative rigidity modulus, rel. to mag. transition temp. 3=25615
 - EuFe garnet, data 3=11043
 - Fe-Ni alloys, Invar type, magneto-elastic coupling 3=25607

Magnetomechanical effects — contd

- Ni, static magnetoelastic coupling theory 3=6701
 Ni-Fe, magnetoelastic anisotropy, temp. depend. 3=18075
 TbFe garnet, magnetoelastic coupling consts. 3=11043

Magneto-optical effects

- See also Optical constants; Zeeman effect.
 alloys, ordered, resonance 3=6645
 atoms, optically oriented, mag. rotatory power 3=4714
 birefringence, gyrotropic, use for antiferromag.
 domain obs. 3=14713
 Centaurus A radio source, Faraday effect 3=11604
 crystals, Faraday effect in strong mag. field., in funda-
 mental absorption-edge region 3=20448
 double resonance detection apparatus 3=5533
 e.m. waves in ionosphere, satellite meas.,
 analysis 3=3495
 enhancement by multiple-beam interference 3=20449
 Faraday effect, in i.r. beam modulation 3=1809
 Faraday effect, microwave, use in modulation of
 light 3=14325
 Faraday rotation in atomic spin system, theory 3=22489
 Faraday rotation meas., v.h.f. range 3=19440
 Faraday rotation, microwave, meas. using bimodal
 cavity 3=12316
 at ferrimagnetic resonance, in YFe garnet 3=6644
 ferromag. domain structure, study by Kerr meridional
 rotation 3=23162
 and ferromagnetic domain obs. 3=23161
 ferromagnetic films, domain structure obs. by Faraday
 effect 3=15806
 ferromagnetic layers, investigation 3=18092
 ferromagnetic metals, Kerr and Faraday coeffs.,
 polarimetric meas. 3=14376
 films, ferromag. and mag. process, freq. var. 3=25536
 free-carrier Azbel'-Kaner cyclotron resonance 3=10638
 gases, imperfect, mag. birefringence. 3=172
 in gyroelectric media 3=11925
 ionosphere, electron contents, from Faraday effect of
 Sputnik 3 40 Mc/s transmission 3=16272
 Kerr effect, contrast variation in study of magnetic
 domains 3=14712
 Kerr effect in ferromagnet, hysteresis loop obs. 3=9904
 Kerr effect, transverse, in magnetic domain photo-
 graphy 3=17023
 Kerr effect, use for readout from magnetized
 oxides 3=14735
 Kerr effect in thin films 3=15654
 Kerr, use for ferromag. domains obs. by polarizing
 microscope 3=24010
 macromolecules, Kerr effect rel. to relaxation time
 measurement 3=8319
 molecules, diamagnetic, Faraday effect, theory 3=6383
 molten salts, up to 1100°C, Faraday rot. meas. 3=7206
 observation using optically-dense dispersive
 media 3=10911
 Permalloy films, longitudinal Kerr effect 3=13157
 plasma electron density meas. 3=4150
 plasma with population inversion, Faraday effect 3=8202
 salts, fused, Verdet consts. and rotativity, 5461 A 3=13158
 semiconductor, microwave Faraday effect 3=2875
 semiconductors, Faraday effect, theory review 3=23047
 semiconductors, interband, semiclass. dispersion
 theory 3=4963
 semiconductors, magneto-absorption reflection,
 dispersion theory 3=10744
 semiconductors, oscillations, as examination
 tool 3=2994
 semiconductors, use of polarized i.r. light 3=14377
 solids, nonlinear, energy considerations 3=13155
 spectropolarimeter, for Faraday effect meas. 3=19026
 transformer steel, polar Kerr effect 3=13252
 Voigt effect, due to free carriers in semiconductors 3=6643
 AlSb, interband Faraday effect 3=8586
 AlSb, i.r. rel. to electron effective masses 3=10816
 Bi, magnetoreflexion oscillations 3=8581
 CdTe, i.r. Faraday effect 3=10812
 Cd_xHg_{1-x}Te, magneto-reflection 3=10938
 Co films, i.r. surface and interior meas. 3=10919
 Co films, rel. to optical constants 3=10918
 CoFe₂O₄, Faraday rotation in films 3=15655

Magneto-optical effects — contd

- CrBr₃, Faraday rotation 3=15656
 CrBr₃, rotation of visible light 3=919
 Er garnets, Faraday effect 3=918
 Eu garnets, Faraday effect 3=918
 Fe films, i.r. surface and interior meas. 3=10919
 Fe, films, longitudinal Kerr effect 3=13157
 Fe films, rel. to optical constants 3=10918
 Fe-35%Ni films, Faraday rotation 3=13156
 GaAs, i.r., Faraday and effective electron mass 3=17986
 GaP, i.r. rel. to electron effective masses 3=10816
 GaSb, Faraday rotation meas. 3=12936
 GaSb, interband Faraday effect 3=8586
 Gd films, Kerr effect, rel. to temp. 3=2993
 Ge, anisotropic effect, in n-type 3=10778
 Ge, interband Faraday effect 3=8586
 Ge, n-type, Faraday effect 3=4964
 Ge, interband Faraday rotation, 0-120 kG 3=25441
 Ge, rotation 3=10772
 Ho garnet, Faraday effect 3=918
 HoFeO₃, Kerr effect rel. to magnetic domains 3=18103
 InSb, Faraday effect for i.r., 290°-500°K 3=15658
 InSb, free carrier and interband absorption 3=10917
 InSb, magneto-absorption 3=10924
 InSb, magnetoplasma reflection with polarized
 light 3=10822
 InSb, oscillatory rotation, 77° and 296°K 3=10823
 Mn ferrites, Kerr effect, mag. domains study 3=13276
 NaFe fluoride, Verdet const 3=25547
 Nd ethylsulphate, Faraday effect 3=8714
 Ni films, i.r. surface and interior meas. 3=10919
 Ni films, longitudinal Kerr effect 3=13157
 Ni films, rel. to optical constants 3=10918
 Ni₂Fe₂O₄, Faraday rotation in films 3=15655
 NiO, birefringence rel. to antiferromag. domain
 structure 3=18109
 Ni-Zn Cr ferrites, Faraday effect rel. to
 permittivity 3=1050
 O₂, Faraday effect, theory 3=5468
 PbS, films, epitaxial, absorpt. lines 3=17984
 PbS, magnetoplasma reflection with polarized light 3=10822
 Si, Faraday effect, i.r. 3=17985
 Y garnet, Faraday effect 3=918
 YFeO₃, Kerr effect rel. to magnetic domains 3=18103
- Magnetoresistance**
 alloys of transition elements in normal metals, low temp.
 anomalies 3=8496
 even-valence metals, Fermi surface "necks" 3=25243
 ferrites, effect of compensation point 3=6719
 ferromag. metals, on localized d-electron model 3=827
 graphite, pyrolytic, rel. to structure 3=826
 measurement, ferromag. films, rotating mag.
 field technique 3=14470
 metals and alloys, mag., anomalies, spin-dependent
 scatt. 3=25319
 negative, rel. to charge carrier scatt. 3=6575
 Permalloy films, rel. to magnetization process 3=15811
 probe to measure field strengths 3=14721
 semiconducting plate, due to carrier density
 change 3=20278
 of semiconductor, electrodeless meas. technique 3=342
 semiconductors, due to hot carriers in strong mag.
 fields 3=10760
 semiconductors, hopping cond., weak field 3=15564
 semiconductors, ionic, in strong crossed elec. and
 mag. fields 3=25339
 semiconductors, rel. to impurity conduction and localized
 spins 3=10737
 semiconductors, transverse, multi-band calc. 3=10754
 semiconductors and semimetals oscillation in strong mag.
 fields 3=6569
 Ag halides 3=12940
 AgBr, meas. at 2°K and up to 18 kG 3=8529
 Al, and crystal point defects, due to α -rays and cold
 working, temp. var. 3=17816
 Al, anisotropy in strong fields at 4.2°K 3=22903
 Al, dimensional and purity effects at low
 temp. 3=15554
 Al, low-temp., up to 20 kG 3=25332

Magnetoresistance — contd

- Al, oscillatory, rel. to thermal conductivity 3=20123
- Al, Sondheimer, oscillations 3=4908
- As, nonohmic, low-temp., thermal origin 3=8512
- Bi 3=22904
- Bi, isothermal transverse, at liq. He temps. 3=25354
- Bi, nonohmic, low-temp., thermal origin 3=8512
- Bi non-linear rel. to electron-phonon interaction
2°-4°K 3=10803
- Bi, thin films, thermal evolution 3=8517
- Bi-Sb alloys, 78°-295°K 3=4958
- Bi-Sb alloys, magneto-thermal resistance 3=10806
- Bi-Sb non-linear rel. to electron-phonon interaction
2°-4°K 3=10803
- Bi₂Te₃, γ -irrad. 3=22712
- C, pyro layers, effect of heat treatment 3=20272
- Cd₃As₂, Cu doped 3=2906
- CdS, rel. to carrier props. 3=8523
- CdSb, pure and doped 3=17971
- CdSb, rel. to band structure 3=10811
- Cu, and crystal point defects, due to α -rays and cold
working, temp. var. 3=17816
- Cu, single-crystals, anisotropy 3=25329
- Cu-(22.8 at.%)Mn, 15 kOe, rel. to temp. 3=13031
- Cu-Cr (0.3%) high-strength alloys, transverse, 4.2., 77°K,
up to 100kOe 3=20274
- Cu-Zr (0.12%) high-strength alloy, transverse, 4.2, 77°K,
up to 100 kOe 3=20274
- Fe-Co alloy, forced, rel. to elec. cond. 3=13042
- Fe-Pt alloy, forced, rel. to elec. cond. 3=13042
- Fe-Si alloys, forced, below room temp. 3=22905
- Ga wires, square-section, size effect 3=17817
- GaAs, 1.8°-300°K 3=10814
- GaAs, rel. to carrier concentration 3=10817
- GaP 3=17879
- GaSb, p-type 3=2912
- Gd films 3=15552
- Ge bicrystal, negative, above 14°K 3=10774
- Ge, heavily doped, 1.6-4.2°K 3=22929
- Ge, impurity cond. 3=13058
- Ge, degenerate n-type calc. 3=20314
- Ge, in impurity conduction range 3=2892
- Ge, low-field in hopping region impurity conduction 3=10775
- Ge, negative, 1.7-290°K, n-type, strongly doped with
Sb 3=20302
- Ge n-type bicrystal, 2-8°-25°K 3=8506
- Ge, n-type, impurity conduction 3=4915
- Ge, in strong mag. fields 3=6581
- Ge, n-type, rel. to mag. fld., 58° to 306°K 3=2887
- Ge, Sb- and As-doped, rel. to compression, 1° to
300°K 3=22951
- HgTe-MnTe alloys 3=20335
- In on InSb wafer electrodes, rel. to specimen
geometry 3=12237
- InAs, at low temps. 3=6596
- InAs, var. with field, up to ~300 kOe 3=17887
- InSb, microperiodic impurity striations, i.r.
meas. 3=22762
- InSb, quantum oscillations in strong pulsed mag.
fields 3=17888
- InSb, rel. to mag. fld. intensity 3=17881
- InSb, var. with field, up to ~300 kOe 3=17887
- Li, three phases 3=10726
- α -Mn, mag. Brillouin zone effects 3=20555
- Mn_{1-x}Fe_xO₄ 3=13270
- Mn₃Ge₂, 0° to 200°C, 16 kOe 3=13028
- Mo, in fields up to 180 kOe, at 4.2°K 3=4909
- Ni alloys, ferromagnetic effect 3=15551
- Ni, anisotropy, rel. to Fermi surface 3=4842
- Ni films 3=17825
- Ni, high-field effect in single crystals 3=15553
- Ni thin films, rel. to ferromag. Curie pt. 3=1077
- Ni wires, thin, rel. to magnetization process and domain
struct. 3=1087
- Ni-Cu alloy, forced, rel. to elec. cond. 3=13042
- Ni-Fe alloy, forced, rel. to elec. cond. 3=13042
- Ni-Zn ferrites 3=20336
- PbS, n- and p-type 3=868
- PbSe, n- and p-type 3=868
- PbTe, n- and p-type, room-temp. and 77°K 3=868

Magnetoresistance — contd

- PbTe, p-type, 4.2°K oscil. with increasing mag.
field 3=15595
 - Pd, in fields up to 180 kOe, at 4.2°K 3=4909
 - Re, in fields up to 180 kOe, at 4.2°K 3=4909
 - Sb, nonohmic, low-temp., thermal origin 3=8512
 - Sb, Ek/Hk = const. at 4.2°K expt. confirmation 3=6563
 - Si, degenerate n-type, calc. 3=20314
 - Si, longitudinal, in d.c. mag. fld. to 90 kG 3=10795
 - Si, p-type, in hopping region 3=8511
 - Sn, dimensional and purity effects at low temps. 3=15554
 - Sn, surface resistance, size effect, Fermi
surface 3=25241
 - Te and electron Fermi surface topology 3=17826
 - TiO, 80°-400°K 3=17894
 - Zn, dimensional and purity effects at low
temp. 3=15554
 - Zn, by He temps. meas. 3=8492
 - Zn, transverse, and periodic mag. breakdown 3=20276
- Magnetostriction**
- coefficients and their relationship to magnetostrictive
eqns. 3=3077
 - directional dependence, pseudovector 3=13261
 - effect of shape, in linear, Fe-Si (1.05, 4.10%) alloys 3=6
 - Elinvar, -195° to +350°C, up to 3800 Oe 3=11053
 - ferrimagnets, cubic Néel 3=15901
 - garnets, nonmagnetic, at microwave freqs. 3=25601
 - magnetoelastic stresses in rotating cylinder in
mag. field 3=23811
 - magnetostrictor, vibrating, dissipative forces 3=19411
 - measurement of constants, from ferromag.
resonance 3=14714
 - measurement, λ_{100} and λ_{111} , single sample, by uniform
compression or tension 3=20579
 - Permalloy films, magnetoelastic sensitivity 3=15842
 - Permalloy films, rel. to added Cu and Co 3=15816
 - Permalloy films, zero magnetostriction 3=11057
 - rotational hysteresis 3=18094
 - steels, composition depend., 20-750°C 3=3114
 - temperature dependence, theory 3=8678
 - vibrator set-up for sound wave prod. 3=229
 - Co ferrite, magnetostriction changes, rel. to
thermomagnetic treatment 3=13264
 - CoO, antiferromagnetic 3=1016
 - Dy, large 3=20550
 - Dy, large, in temp. range including Néel and Curie
points 3=20551
 - Dy, rel. to magnetic structure, helical 3=6716
 - Dy, temp. depend. 3=5017
 - Dy, temp. var. 3=6711
 - Fe, rel. to band structure 3=8665
 - Fe sheets, magnetization depend. 3=13260
 - Fe-transition metal dilute alloys, 4°-300°K 3=1045
 - Fe-Co alloys, forced, meas. 3=1046
 - Fe-Ni alloys, forced, meas. 3=1046
 - Fe-Ni alloys rel. to elastic stress 3=1062
 - Fe-Ni films, composition and angular
variation 3=11064
 - FeNi₂, and magneto-thermoelectric power 3=13262
 - Fe-(50-100%)Ni, volume magnetostriction 3=6713
 - Fe-Pt alloys, forced, meas. 3=1046
 - Fe-Si alloy, ellipsoidal, shape effects 3=3116
 - Fe-Si (1.05, 4.10%) alloys, effect of shape, on
linear 3=6712
 - Fe-Si, influence of grain interaction 3=5016
 - Fe-Si sheet, polycrystalline 3=8679
 - Ga, temp. depend. 3=5017
 - Gd single crystal 3=15851
 - Gd single crystals 3=11092
 - Gd single crystals, anomalies 3=6714
 - Ho, in mag. fields up to 15000 Oe 3=8680
 - Ho, large 3=20550
 - Ho, rel. to temperature 3=11091
 - Ho, 20.3, 77°K 3=18118
 - Mn, Mn-Mg ferrites 3=23189
 - MnCo ferrite, at low temps. 3=5023
 - Mn_{1-x}Fe_xO₄, const., -100°C to room temp. 3=1031
 - Ni films, rel. to anisotropic shape effects 3=15815
 - Ni, jumps, measurement 3=8664
 - Ni, rel. to band structure 3=8665

Magnetostriction — contd

- Ni, saturation, up to 10^4 atm 3=1150
 Ni, temp. hysteresis 3=3101
 Ni-Fe films, rel. to internal stresses 3=20595
 Ni-Fe films, rel. to rotatable mag. anisotropy 3=15843
 Ni-Fe, temp. depend. and anisotropy 3=18075
 Ni-Mn, composition, temp., ordering depend. 3=23177
 NiO, antiferromagnetic 3=1016
 Si-iron, rel. to field and external stresses 3=8663
 Si-Fe rods, temp. depend. 3=1151
 Tb, in mag. flds. up to 15000 Oe 3=8680
 Tb, rel. to temperature 3=11091
 YFe garnet 3=15852
 YFe garnet, meas. and theory 3=15901
 YFe garnet, single crystal, saturation effect 3=15888

Magnetothermal effects

- in antiferromagnets 3=15529
 Corbino expt. using cylindrical mag. field 3=1925
 elasticity, plane problem 3=23816
 electro-thermomag. generators, efficiency 3=9715
 Ettingshausen longit. effect, theory of cooler 3=14408
 ferrite cores, saturation 3=1153
 ferrite cores, saturation 3=6727
 ferromagnets, screening 3=20593
 figure of merit, thermodynamic bound 3=358
 galvanothermomagnetic energy-conversion devices 3=356-7
 galvanothermomagnetic energy converters, anisotropic materials 3=21695
 magnetite, anisotropy 3=23166
 graphite, pyrolytic, Ettingshausen cooling 3=15530
 magnetothermomechanics, theory 3=5012
 Nernst-Ettingshausen effect, anisotropy, in orthorhombic lattice 3=23166
 Nernst-Ettingshausen generator, nondegenerate semi-cond. 3=3998
 Nernst figure of merit, optimization criteria 3=20257
 Nernst generators and refrigerators, theory 3=10863
 Nernst generators, anisotropic and adiabatic 3=21694
 plasma, nonequilibrium, thermomag. waves 3=21843
 semiconductors, degenerate, rel. to mutual electron and phonon drag 3=20290
 semiconductors with degenerate band, theory 3=17832
 semiconductors, longitudinal effects in strong fields 3=2866
 semiconductors, standard and Kane band models 3=20289
 semimetals, standard and Kane band models 3=20289
 temp. oscillations with field for isolated crystals at low temp. 3=2743
 theory, from Boltzmann-Lorentz eqn. solution 3=10892
 theory, review 3=466
 Bi, at liq. He temps. 3=25354
 Bi, temp. oscillations with field for isolated crystals at low temp. 3=2743
 Bi, Kelvin thermoelec. reln. in mag. field 3=8573
 Bi, Bi-Sb, Ettingshausen figure of merit 3=13070
 Bi-Sb alloys, figure of merit, and Ettingshausen cooling 3=22938
 Bi-Sb alloys, 78° - 295° K 3=4958
 Bi-Sb alloys, up to 23 at.%Sb, band structure explanation 3=20324
 CdSb, Nernst-Ettingshausen effect, pure and doped material 3=17971
 CdSnAs₂, Nernst-Ettingshausen coeffs., 100-600°K 3=17970
 CdSnAs₂-InAs, solid solutions, Nernst-Ettingshausen coeffs., 100-600°K 3=17970
 Cu-(22.8%)Mn 3=8694
 Fe-Ni-Al-(Co) alloys, rel. to uniaxial anisotropy 3=25524
 Fe-Ni-Mo alloy, rel. to magnetic anisotropy 3=25538
 Fe₂O₃, longitud. Nernst-Ettingshausen, anomaly 3=25532
 FeTiO₃-Fe₂O₃, reverse thermoremanent mag. 3=13255
 GaSb, n-type, Nernst effect 3=10819
 Gd-Cd alloys, rel. to antiferromag. props. 3=1000
 GdCl₃, magnetocaloric effects 3=15803
 Gd-Co alloys, rel. to antiferromag. props. 3=1000
 Ge, calc. by scattering theory 3=17855
 InAs, Nernst-Ettingshausen coeffs., 100-600°K 3=17970
 InAs, Nernst-Ettingshausen effect at low temps. 3=6596

Magnetothermal effects — contd

- In-Bi (3 at.%), superconductive, thermal cond., 2.16° K, var. mag. field 3=12032
 InSb, n-type 3=17882
 InSb, rel. to temperature and degrees of degeneracy 3=10820
 UH, and UD, low temp. 3=8673
 UD, and UH, β -modification 3=6692
 Zn, by He temps. meas. 3=8492

Magnetrons

See Electron tubes.

Magnets

- Alnico, sintered, crystal structure 3=16094
 bakeable, for high power travelling wave tubes 3=9908
 electromagnet, 11 000 to 42 000 G, 6-30 mm operating space 3=24429
 electromagnet, for plasma, θ -pinch, edge effect compensation 3=19264
 electromagnet, 1 kW precision current supply 3=19136
 electromagnet, superconducting winding 3=14726
 electromagnet with stepped poles, 10 000 Oe 3=14727
 electromagnetic deflector, for particle accelerators, orbital 3=17010
 electromagnets, current stabilized, electronic sweep unit 3=19405
 electromagnets, for C-stellarator, stresses and temp. 3=12189
 electromagnets, high power, design 3=2085
 electromagnets, superconducting, current prod., flux pump 3=17027
 electromagnets, superconducting, high-field, current carrying capacity 3=16881
 electromagnets, superconducting, Joule heating effects 3=12037
 electromagnets, superconducting, Nb₃Sn short wire tests 3=19408
 electromagnets, superconducting, NbZr, field collapse 3=19409
 electromagnets, superconducting, review 3=17028
 electromagnets, superconducting, short wire tests 3=19407
 focusing, in particle accelerators, ideal pole faces 3=24396
 granular structure, compacted Fe-Co particle, fracture surfaces, by replica 3=20920
 high-field, liquid H₂-cooled, Al-wound 3=21931
 high-field, 150 kG, pulsed for hyperon mag. moment meas. 3=21933
 high-field, pulsed and superconducting, Frascati, Italy 3=21836
 high-field, superconducting, pulsed, review 3=21932
 high-field, 200 kG, pulsed, for emulsion expts. 3=21934
 high-field, 340 kG, pulsed, unconstrained Hg coil 3=21935
 ideal pole faces, weak, strong, FFAG-focusing nuclear instruments 3=9881
 ion beam, mirror, achromatic 3=14672
 magnetic flux distribution 3=470
 magnetization coils without Fe core, theory 3=12291
 for meas. mag. field, giving equal field 3=17024
 particle accelerator, betatron, circuit technology 3=17009
 power supply, Si controlled rectifier, stabilized 3=19137
 quadrupole, for particle focusing, design and calc. 3=447
 superconducting, coils, electrical flux-pump power source 3=14463
 superconducting, Frascati, Italy 3=21836
 superconducting, protection against overheating 3=14728
 superconducting, review 3=339
 superconducting, review 3=21932
 superconductive, Nb rings round Armco core 3=19410
 superconductors as permanent magnets 3=338
 superconductors as permanent magnets 3=14464
 testing method for simple shapes 3=7677
 various types for high mag. fields, review 3=21930
 AlNiCo 500, AlNi, structural constituents, by microsonde and microhardness 3=16080
 (Fe,Co)₂P alloys, use Curie temps. and coercivities, ground to diff. degrees of fineness 3=15786
 Ni-Zr superconducting solenoid, 8.8 kG 3=7678
 Sr ferrite, modified, new permanent magnet material 3=15861

Manganese

- absorption spectrum in solid Ar, 4°K 3=23074
 atom, h.f.s. meas. 3=12564
 cathode, fluorescence yield, by X-ray photoeffect meas. 3=6663
 e.p.r., Mn^{2+} in $CaCO_3$, calc. 3=23231
 diffusion in $NaCl \cdot MnCl_2$ and $NaCl$ crystals 3=6535
 ions, electron spin resonance in BaF_2 3=11111
 paramagnetic reson. and relax., electric fields effects, calc. 3=18126
 paramagnetic resonance in Pd, hyperfine structure 3=15945
 paramagnetic susceptibility in α and β brasses 3=23140
 valency in α and β brasses from susceptibility 3=23140
 Fe^{2+} , e.p.r. in $MgAl_2O_4$ spinel 3=8711
 Mn e.s.r. in GaAs at 77°K, meas. and theory 3=3177
 α Mn M^{55} n.m.r., 1.5° to 4.2°K 3=15960
 α -Mn, mag. Brillouin zone effects on magnetoresistance, thermoelec. power 3=20555
 Mn^{2+} , e.p.r. in glasses 3=20651
 Mn^{2+} , e.p.r. in $MgAl_2O_4$ spinel 3=8711
 Mn^{2+} , e.p.r. in $MgAl_2O_4$ spinel 3=8712
 Mn^{2+} , e.p.r. in MgO, additional biquadratic exchange term in spin Hamiltonian 3=20627
 Mn^{2+} , e.s.r. in CaO 3=3181
 Mn^{2+} , e.s.r. in CdSe 3=11115
 Mn^{2+} , e.s.r., in SrS 3=5042
 Mn^{2+} impurity in Ca fluorophosphate, absorpt. spectrum 3=13168
 Mn^{2+} , in GaS, e.s.r. 3=8713
 Mn^{2+} , line broadening of P^{31} n.m.r. absorpt. in H_2PO_4 3=13316
 Mn^{2+} pairs in Mn, ZnF_2 , e.s.r. 3=3176
 Mn^{2+} , quadrupole antishielding factor 3=12772

Manganese compounds

- ferrite, anisotropy, induced uniaxial, effect on impulse behaviour 3=15893
 ferrites, rectangular hysteresis loop 3=23189
 formates, hydrated, low temp. mag. props. 3=18056
 Invar, isothermal holding, internal friction, magneto-diffusion effect 3=3216
 manganites of rare earths and Y, prep., dielec. props. 3=13119
 Mn-Al, Cu substituted, mag. props. rel. to Cu content 3=25529
 Mn-Al-Fe alloys, CsCl-type ferrimagnetic κ -phase 3=1007
 Mn alloys, magnetic interactions 3=1001
 MnAs, first-order mag. phase transition 3=13226
 MnAs, magnetic first-order transition and anisotropy 3=15753
 MnAs, mag. transition rel. to disorder 3=1002
 MnAs, n.m.r., zero ext. field 3=3198
 MnAu₂, antiferromagnetic, transformation, threshold field magnitude and temp. rel. to pressure 3=18116
 MnAu₂, ferro-antiferromagnetic transform., exchange interaction mechanism 3=20573
 MnAu₂, Hall effect, mag. field depend. 3=2854
 MnAu₂, magnetization, field depend. 3=2854
 MnAu₂, magnetization in pulsating fields, temp. depend. 3=3136
 MnB, electronic structure 3=6488
 MnB, paramag. props. (150-800°K) and thermo-electricity 3=1124
 Mn-Bi alloy, small particles, domain struct. rel. to temp. 3=18093
 MnBi, mag. nucleation near dislocations 3=5009
 MnBi, mag. reversal processes in particles 3=8657
 MnBi, mag. switching rel. to particle size 3=13251
 MnBi, n.m.r., zero ext. field 3=3198
 MnBr₂·4H₂O, adiabatic magnetization, cooling effect 3=15908
 MnCO₃, crystallization in $MnCO_3$ - RCl - H_2O , [R = Na, Li, K, Ca, Mn, Co] 3=18267
 MnCO₃, high-freqn. ferromag. resonance 3=13290
 MnCO₃, magnetic anisotropy 3=3098
 MnCO₃, r.f. ferromag. suscept. meas. 3=11051
 MnCO₃, specific heat, 1.8° to 70°K, rel. to antiferromag. transition 3=17659
 MnCO₃, specific heat rel. to mag. props. 3=3145
 Mn₂(CO)₁₀, crystal structure 3=13489
 MnCl₂, liq. He temps., specific heat in appl. mag. fields 3=2731
 MnCl₂, n.m. relax. meas. 3=4282
 MnCo ferrite, mag. props. at low temps. 3=5023
 (MnCo)₂B, Curie points and magnetic moments 3=8637
 Mn complexes, s- and p-bonding 3=10564
 Mn-Cr, Brillouin zone effects on elec. cond. 3=20554
 MnCr₂O₄, mag. structure, neutron diffr. data 3=11101
 MnCr₂O₄, mag. structure by neutron diffraction 3=1112
 Mn_{1-x}Cr_xSb, antiferromagnetic-ferrimagnetic transition, meas. 3=17022
 Mn_{2-x}Cr_xSb, ferrimag. and antiferromag. 3=13282
 Mn_{2-x}Cr_xSb, x = 0.023-0.10, mag. structure 3=23197
 Mn-Cu alloys, mag. susceptibility rel. to temp. 3=3081
 Mn-Cu alloys, paramagnetism, above m.p. 3=23906
 Mn-Cu alloys, specific heat rel. to temperature, theory 3=8358
 MnF₂, antiferromag., lattice thermal cond. theory 3=25212
 MnF₂, F^{19} n.m.r. near Néel pt. 3=3195
 MnF₂, luminescence, temp. var., large 3=23102
 MnF₂, mag. exchange integrals 3=3120
 MnF₂, mag. props., effect of cooling 3=3143
 MnF₂, magnetic susceptibility, 1°-45°K 3=18115
 MnF₂, nuclear spin-lattice relax., calc. 3=18137
 MnF₂, optical absorpt. bandwidth, temp. depend. 3=25461
 MnF₂, spin distribution neutron scatt. study 3=15736
 MnF₂-ZnF₂, Neel temp. by n.m.r. 3=1055
 Mn-Fe, Brillouin zone effects on elec. cond. 3=20554
 Mn-Fe, ferrites, mag. viscosity and hysteresis 3=6724
 Mn-Fe solid solutions, electronic specific heat 3=8367
 (MnFe)₂B, Curie points and magnetic moments 3=8637
 Mn-Fe-Cr, Brillouin zone effects on elec. cond. 3=20554
 MnFe₂O₄, low-field magnetization, temp. depend. 3=13271
 MnFe₂O₄, Mn^{55} n.m.r. 3=15965
 MnFe₃O₄, magnetocrystalline anisotropy, 4° to 225°K 3=1028
 Mn_{1-0.9}Fe_{0.9}O₄, crystal structure 3=13463
 Mn_{1.16}Fe_{1.84}O₄, elec. props., heat treatment depend. 3=22949
 Mn_xFe_{1-x}O₄, mag. anisotropy, magnetoresistance 3=13270
 Mn_xFe_{1-x}O₄, mag. anisotropy, origin 3=11058
 Mn_xFe_{1-x}O₄, magnetostriction consts. 3=1031
 Mn_xFe_{1-x}O₄, mag. anisotropy, origin 3=11058
 Mn_xFe_{1-x}O₄, neutron-diffraction study 3=1114
 Mn_xFe_{1-x}O₄, relaxation spectrum 3=1037
 Mn ferrite, decay phenomena, rel. to domain walls 3=8689
 Mn ferrite, disaccommodation rel. to cation vacancies 3=11097
 Mn ferrite, effect of Li subst. on mag. props. 3=15891
 Mn ferrite, lattice const. and X-ray refl. 3=3304
 Mn ferrite, magnetization 3=15890
 Mn ferrite monocrystals, electrical conductivity 3=20334
 Mn-Ga, ϵ phase, mag. props., temp. var. and lattice consts. 3=15900
 Mn_{2.65}Ge, mag. moment rel. to sublattice metallic and covalent nature 3=1005
 Mn₂Ge₂, magnetiz. curves, anomalies 3=15775
 Mn₂Ge₂, magnetoresistance, 0° to 200°K, 16 kOe 3=13028
 Mn₂Ge₃, domain structure 3=23481
 Mn₂Ge₃, domain struct. and mag., near Curie temp. 3=13250
 Mn₂Ge₃, domain struct. and mag. props. 3=1086
 Mn₂Ge₃, domain structure rel. to external mag. fld. 3=310
 Mn₂Ge₃, mag. anisotropy 3=23154
 Mn₂Ge₃, mag. moment rel. to sublattice metallic and covalent nature 3=1005
 Mn₂Ge₃, Mn^{55} n.m.r. 3=15961
 MnH, \mathcal{Z} term, multiplet splitting 3=6388
 Mn(H₂O)₆²⁺, e.s.r. in aqueous glass 3=6748
 MnHg, crystal distortion and magnetic transition, -75°C 3=6860
 Mn-Mg-Co ferrite, crit. microwave field strength 3=3160
 Mn₄N, electron number of N atom 3=12890
 Mn₄N, Mn^{55} n.m.r. 3=15961
 Mn-Ni solid solutions, electronic specific heat 3=8367
 MnNi₃, creep rate rel. to equilb. state, 450°C 3=6790

Manganese compounds — contd

- Mn—Ni—Cu alloys, polygonization 3=3315
 MnO, elasticity, temp var., anomalies 3=6774
 MnO, far i.r. antiferromag. reson. 3=8703
 MnO fine grains, superparamag. and superantiferromag. props. 3=1093
 MnO, mag. susceptibility rel. to temp. 3=1015
 MnO whiskers, growth 3=23413
 MnO₂, γ - β transform., X-ray study 3=23376
 MnO·Fe₂O₃, domain obs. by Kerr effect 3=15864
 MnOOH, hydrogen position detm. by neutron diffraction 3=1335
 Mn orthosilicates, mag. props. 77°-300°K 3=23142
 MnP, magnetic props. and 50°K transition 3=15735
 MnP, n.m.r., zero ext. field 3=3198
 MnPt, mag. spin distribution 3=15860
 MnRh ordered alloy, mag. props. and phase transformation 3=15752
 MnS, α , β and γ -phases, electronic states of Mn²⁺ 3=20072
 MnS, magnetic susceptibility, rel. to oxygen impurities 3=25554
 MnSO₄·H₂O, crystal structure 3=18327
 Mn₂Sb, antiferromag. —ferrimag. first-order transition 3=1026
 Mn₂Sb, aspherical spin density 3=15896
 Mn₂Sb, mag. anisotropy energy rel. to temp. 3=1129
 Mn₂Sb, n.m.r., zero ext. field 3=3198
 MnSb—CrSb system, magnetic structure 3=8698
 Mn—Si alloys, elec. props. 3=871
 Mn—Si, liquid, magnetic susceptibility 3=3816
 Mn₂Si₃, mag. moment rel. to sublattice metallic and covalent nature 3=1005
 MnSiF₆·6H₂O, adiabatic demagnetization curves 3=14709
 MnSn₂, 73°K magnetic transition 3=15754
 Mn₂Sn (1.45 \leq x \leq 2.05) sat. mag. mom. rel. to x 3=1005
 MnTe, crystal structure, atomic, high temp., fictitious transforms. 3=23469
 MnTe₂ powder, neutron diffraction analysis, rel. to temp. 3=5019
 Mn telluride, mag. props. 3=11104
 MnTi_xFe_{2-x}O₄, magnetocrystalline anisotropy, 4° to 225°K 3=1028
 MnTiO₂, powder, antiferromagnetic resonance 3=23217
 Mn-Tutton salt, antiferromagnetism 3=1058
 MnUO₄, magnetic structure 3=3139
 MnV₂O₄ spinel, mag. structure, by neutron diffr. 3=5026
 Mn_{0.5}V_{0.5}Fe_{0.5}Ge_{0.5}O₁₀, structure and magnetic properties 3=15867
 MnYO₃, ferroelec. oscill. times under steeply rising voltage pulses 3=25402
 MnYO₃, from neutron diffr. exam. 3=20610
 Mn—Zn alloys, mag. props. rel. to composition and structure 3=1006
 MnZn₃, crystal distortion and magnetic transition -125°C 3=6860
 Mn—Zn ferrite, growth, rel. to porosity 3=3269
 MnZn ferrite, mag. curves rel. to pressure 3=13277
 Mn—Zn ferrites, induced anisotropy & disaccommodation 3=1034
 Mn—Zn ferrites, polycrystalline, crystals growth 3=6822
 Mn—Zn—Fe ferrites, permeability, anisotropy 3=20619
 Mn, ZnF₂ mixed crystals, Mn²⁺ pairs e.s.r. 3=3176

Manometers

- See also Vacuum gauges.
 electronic, for blood pressure meas., dynamic char. 3=1548
 micromanometers, rotational, design 3=3782
 oil, sloping limb, out gassed by mag. stirring, down to 5×10^{-2} torr 3=21459
 piston, two-stage, up to 1000 atm 3=23831
 pitot tube performance, supersonic flow, rarified 3=14197
 relay, for prevacuum system 3=1653

Masers

- ammonia beam, with rectangular resonator for ease of tuning 3=12337
 ammonia (N¹⁵H), two opposed beams, parameters varying freq. 3=12358
 amplification by dielec. filament 3=17071
 atomic hydrogen 3=12342
 atomic hydrogen, design and performance 3=12343

Masers — contd

- atoms and molecules, radiation, stimulated emission, in strong e.m. field 3=17069
 beam type, oscillation frequency, rel. to ether drift 3=12357
 book 3=14795
 cavity, correl. functions, theory 3=12355
 conference report, Paris (1963) 3=19475
 coupled cavity, influence of circuits 3=9996
 emission frequ. higher than pumping frequ. 3=9991
 4-level system, pumping 3=22490
 gas, resonant absorption of several oscillating fields, nonlinear effects 3=2144
 hydrogen, atomic, as freq. standard 3=9992
 inert-gas, e.m. transition probabilities 3=22005
 magnetic resonance applications, review 3=5031
 media with negative absorption, radiation reaction 3=14033
 millimetre wave, survey 3=5835
 molec. generator, spectral line-width meas. 3=5897
 molecular, beam focusing, ring and helical electrodes 3=16987
 molecular electron vibr., 4 level scheme 3=22001
 molecular, with two consecutive resonators 3=12359
 multilevel analysis, linear graphs appl. 3=9995
 multilevel systems, combinatorial formula 3=9994
 multilevel systems, normalized population distrib. calc. 3=9993
 noise limits 3=5891
 noise, quantum, derivation 3=5837
 oscillator, solid-state, as frequency standard 3=9989
 oscillator spectrum, rel. to classical nonlinear self-oscillators 3=5889
 paramagnetic crystals, usage in devices, review 3=24505
 parametric interaction eqns., three-dim. 3=5886
 particle system with 3 energy levels 3=17070
 phototron, physical principles 3=524
 populations calc. with cross relax., by partial distrib. 3=7732
 proton magnetic resonance oscillator 3=14797
 quantum statistics of radiation field 3=12356
 radiation receivers, sensitivity 3=19478
 rate eqns. and transient oscillations 3=24506
 recent developments 3=2
 resonator stationary state stability 3=17081
 ruby and ammonia, amplifiers 3=5892
 ruby and crystal internal field non-uniformity 3=20048
 ruby crystals, e.s.r. appraisals 3=22763
 ruby, for radar astronomy use 3=5894
 ruby, laser-pumped, at millimeter wavelengths 3=22003
 ruby, pulsed, oscillation characteristics 3=520
 ruby travelling-wave, pumping systems, efficiency 3=22002
 rutile, Cr-doped, cross-relax. effect 3=14798
 spectrometer, maser 3=12354
 three-level cavity, oscillation characteristics 3=22004
 3-level, effect of small Stokes shift on operation 3=25446
 threshold conditions at h.f., unified theory 3=7731
 transient coherence 3=3861
 transmission of monochromatic radiation in two-level material 3=9990
 travelling-wave, ruby S-band, design 3=5887
 travelling-wave, theory, design, performance and applic. 3=5893
 two-level oscillators, spin magnetization nutations 3=24507
 HCN molecular beam-type 3=12344
 N¹⁴D₃, inversion line J = 6, K = 6, hyperfine structure 3=2633
 NH₃ beam, characteristics 3=12352
 NH₃, beam focusing, ring and helical electrodes 3=16987
 NH₃ beam, oscill. freq., meas. 3=12353
 NH₃, for e.s.r. spectrometer, as pre-amplifier 3=21991
 NH₃, operating characteristics 3=12345
 N¹⁴H₂ double-beam, 3-2 line characteristics, and frequency comparison precision 3=12347
 N¹⁵H₂ double-beam as primary frequency standard 3=12346
 N¹⁴H₂, 3, 2 line, as freqn. standard 3=519

Masers — contd

TiO₂ doped with Fe³⁺, operation
96 gc/s 3=523

optical

See also Optical pumping.

- amplification of light, theory 3=7301
- amplifiers, forward and backward wave, max. gain 3=22019
- for ang. velo. meas. 3=9401
- aromatic molecule orientation in laser,
possibility 3=2610
- atoms inside Fabry-Perot interferometer 3=7352
- basic concepts and progress review 3=7728
- beam analysis, photoelec. fluctuations correlator 3=9596
- beating two masers, far i.r. production 3=14334
- book 3=14795
- calorimeter, liquid, for high energies 3=9984
- coherence 3=12338
- conference, September 1962, London 3=9963
- continuous glass laser 3=24526
- crystal elements production 3=9969
- crystals, figure of merit, meas. 3=19476
- cylinder laser, energy density distribution 3=14803
- dielectric, nonlinear, axial mode difference frequency
generation 3=24508
- difference freq. obs., with lamp, in KDP crystal 3=18955
- dynamic behaviour of oscill., theory 3=17079
- electron thermionic emission, induced by laser
beam 3=19304
- electrons, scattered by intense polarized beam, obs.
possibility 3=12448
- emission time-resolution by ultra-rapid
photography 3=12341
- energy level identification by spectroscopic
techniques 3=24518
- excitation, by exploding wires as light sources 3=9588
- excited states, lifetime, from intensity/time meas. 3=6648
- Fabry-Perot interferometer-resonator 3=9590
- use in first-order relativity test 3=5343
- fluoride single crystals for, growth 3=23397
- four-level, effect of var. materials,
formulae 3=24517
- frequency-mixing observation in p-n junction 3=9981
- frequency shift, resonant, by Ladenburg classical
dispersion theory 3=17086
- frequency stabilization and precise wavelength
meas. 3=22022
- gain saturation and output power 3=24018
- gas, He-Ne or CO₂, pulsed, high power 3=9987
- gas, He-Ne, for harmonic generation, continuous 3=21506
- gas, He-Ne, harmonic generation, continuous 3=21507
- gas (He-Ne) maser interferometer, diffraction
studies 3=9614
- gas, inert, i.r., 2.5-13 μ , new freq. possibilities 3=17075
- gas ionization obs. 3=19170
- gas, mag. field effects on output, var. r.f.
excitation 3=24510
- gas, power dip at centre of line, theory, low
fields 3=24514
- gas, power output and gain, calc. 3=17087
- gas, review 3=9965
- gas, small, continuous, higher pressure, He-Ne 3=5888
- gas, tuning, by heating, mode patterns 3=9977
- gas, window seal 3=22026
- gaseous, detailed review 3=7730
- gaseous, with external concave mirrors 3=7318
- generation and oscill. systems, review 3=17080
- giant pulse evolution 3=17082
- Glass, Nd³⁺, 9180 Å, 80°K 3=12339
- harmonic generation and mixing of CaWO₄:Nd³⁺ and
ruby beams in piezoelec. crystals 3=7359
- harmonic generation, in KH₂PO₄, mode effects 3=23995
- harmonic generation, saturation effects 3=12340
- heterodyning, spurious harmonic generation 3=21508
- higher order cavity modes 3=22009
- information rate 3=19477
- interaction, nonlinear, of modes with atoms 3=12361
- interference rings in far-field pattern,
interpretation 3=24513
- interference, two independent masers 3=16795
- interferometer, for plasma density meas. 3=19276

Masers — contd

optical — contd

- interferometers, diffraction losses 3=24045
- interferometers, diffraction losses, calc. 3=16794
- internal modulation 3=9979
- laser and iraser, solid state, pumping requirements 3=7733
- laser radn. interact. with vibrating surfs. 3=6647
- light absorption, negative coeff. 3=9597
- light, rectification, in crystals, with sufficiently low
symmetry 3=5537
- light source, modulated at 200 Mc/s 3=5895
- line width, rel. to chain reaction 3=9976
- liquids, ring compounds, Raman scatt. stimulated
emission 3=5445
- luminescence spectra of maser materials, use of
Michelson interferometer 3=7353
- luminescence, two-photon excitation, aromatic polycyclic
crystals 3=11002
- use in meas. of thermal diffusivity 3=3910
- military and civilian tech. applics.,
conference, Hague, April 1962 3=518
- mirrors, dielectric, scattering, light 3=16805
- mode selector, tilted Fabry-Perot etalon 3=17085
- modulation, by internal reflection barrier
modification 3=16763
- modulator, broadband, by polarized emission
deflection 3=22023
- modulator, using piezoelec. medium 3=3875
- molecular vibrational level pair excitation, i.r.,
possibilities 3=15327
- molecular vibrations, coherently driven, and light
modulation 3=24524
- multiple-beam interferometry, large plate-
separations 3=21561
- neon, oscills., ~1.8 μ , f-d transitions 3=14806
- new materials, with trivalent rare-earth
ions 3=23055
- nonlinear effects in gas for several oscillating
fields 3=2144
- non-linear interactions, review 3=17093
- optical absorption as photomixing process 3=22025
- optical harmonics and nonlinear phenomena
review 3=21505
- optical power limiter, using nonlinear materials 3=14331
- organic cpds, stimulated emission 3=23886
- organic mols., Eu, Sm, by internal energy transfer,
possibilities 3=17072
- output directivity, for various geometrics 3=24509
- papers on or related to lasers, list 3=7729
- photomixing expts. using microwave phototube 3=7320
- plasma, emission and pumping, review 3=22007
- for plasma, θ -pinch, light scattering 3=19256
- polariscope to analyse light 3=21570
- population inversion in gas discharge 3=7467
- power and efficiency for continuous operation 3=12349
- power limiter, using nonlinear crystal props. 3=7319
- principles, descriptions, applications 3=14799
- as pulse amplifier, photon transport eqns. 3=23053
- pump lamp focussing, double mirror 3=22010
- pumping power systems, efficiency 3=14333
- pumping power systems, theoretical efficiency 3=7733
- pumping radiation transfer by ellipt. cyl.
reflectors 3=14332
- α -quartz, optical phonons, quantum electronics 3=9966
- radiation detect. with photoelec. device, noise 3=1810
- radiationless transitions, lifetimes calc. 3=6646
- Raman scatt., stimulated, theory 3=14374
- rare-earth, d.c. - pumped 3=24521
- rare-earth ions in crystals, maser action 3=12350
- rare earth organometallic cpds. as laser materials 3=9966
- reflection, non-linear, exptl. verification of
laws 3=24017
- regeneration switching, theory 3=14802
- relativity ether drift detection, interferometer, aerosol
scatt. proposal 3=18711
- resonator, interferometer, isolation of 15 modes 3=9974
- resonator, microwave interferom. as model 3=12360
- review 3=22006
- review lecture 3=9964
- rod, dielectric, focusing and pumping 3=18967

Masers — contd

optical — contd

- ruby, amplitude-modulation of output by u.s. diffraction shutters 3=24016
- ruby and crystal internal field non-uniformity 3=20048
- ruby, appl. in high-speed photography 3=1841
- ruby, at liq. N₂ temp., wavelength component relationship 3=19488
- ruby, axial mode frequency mixing in CdSe 3=9970
- ruby, characteristics invest. with microwave phototubes 3=22012
- ruby, coherence and directionality test 3=7739
- ruby, continuous quasi 3=9988
- ruby, continuously operating 3=14800
- ruby, cooling effect, application 3=15660
- ruby, cylindrical mode of oscillation 3=19482
- ruby, electric field, effects 3=19485
- ruby, emission coherence studies 3=24529
- ruby, emission, 55° to 300° K 3=19483
- ruby emissions, time-resolved spectroscopy 3=14335
- ruby, end-plate polishing and elliptic reflector fabrication techniques 3=9978
- ruby, in Fabry-Perot resonator, high mode selection 3=24527
- ruby, Faraday effect as Q-switch 3=24520
- ruby, giant pulses production 3=9968
- ruby, giant pulse 3=22020
- ruby, higher order modes, detection 3=19484
- ruby, "hole-burning" model of oscillation 3=22013
- ruby, improved Xe light source 3=18980
- ruby, interference rings in beams 3=23056
- ruby, laser action in ring sample 3=9972
- ruby laser, cavity termination 3=1811
- ruby laser emission, time-resolved interferometry 3=11907
- ruby laser, light across end, spatial distribution 3=7315
- ruby laser, mode selection and enhancement 3=7316
- ruby laser rods, side emission reduction 3=521
- ruby laser, total cavity loss 3=16762
- ruby, level pop. inversion, rel. to cross-relax. 3=9983
- ruby, light distrib. 3=2997
- ruby, light emission study 3=14336
- ruby, light source system 3=9589
- ruby, mixing with CaWO₄:Nd³⁺ beam in piezoelec. crystals 3=7359
- ruby, mode selection, by aperture variation 3=14804
- ruby, mode sequences 3=9986
- ruby, optical pumping using exploding wires 3=22011
- ruby, optical quality, radiation patterns 3=25057
- ruby, oscillations with large (15m) mirror separation 3=14810
- ruby, pink, pulsed, emission props. 3=17077
- ruby, power increase, by resonator shutter modulation 3=17073
- ruby, pulse power enhancement by rotating shutter 3=522
- ruby, pulse power enhancement by rotating shutter 3=7740
- ruby, Q-spoiling, using exploding film 3=14809
- ruby, quantum efficiency 3=24519
- ruby, quasi c.w. operation 3=4283
- ruby, quasi c.w. operation, obs. 3=5896
- ruby, rod output spikes, correl. between end portions 3=9973
- ruby, single-mode, travelling-wave damping 3=19489
- ruby, spikes, var. with pump power 3=19487
- ruby, stabilization by electro-optical shutters 3=5890
- ruby, time variation of freq. and line-width 3=2142
- ruby, toroidal, advantages 3=14807
- ruby, u.s. modulation of resonance sharpness 3=19486
- ruby, use as Raman light source 3=7347
- ruby, use in photography, high-speed 3=11960
- scattering, by electron beam 3=16803
- scattering of laser radiation, coherent source pattern 3=14372
- second harmonic generation in crystals 3=1839
- second harmonic generation in quartz 3=17083
- second harmonic generation, theory 3=15640
- semiconducting, p-n junction, loss reduction, by doping var. 3=22021

Masers — contd

optical — contd

- for semiconductor recombination luminescence excitation 3=20538
- semiconductors, low temp., leakage decrease 3=20305
- shutter, using u.s. refraction 3=12348
- solid, review 3=9965
- solid-state spectra appl., spectroscopy 3=7330
- spectral line shape far field pattern, non-axial modes 3=19480
- spectral output and spiking 3=23054
- spectroscopic aspects, Conference, Great Malvern 1963 3=24039
- spherical sheath for focusing pumping light on maser rods 3=11906
- stimulated Raman scatt. of giant laser pulse 3=21569
- sun-powered, optical condenser 3=21534
- thermionic emission, electrons and positive ions, induced from metals and semiconductors 3=24333
- thermionic emission induction, Th-W, ruby 3=19305
- thermionic emission induction, W cathode 3=21857
- three-level, Maiman equation solution with non-linearity 3=19479
- three-level systems, one and two-photon transitions 3=9967
- threshold pumping efficiency, rel. to generator properties 3=19481
- transmission, guided, by fibres, reflecting tubes, lenses in tubes 3=21510
- two-level, pumping transients and damped osc. in output 3=24511
- vapourization, C, by 30 MW, photographic obs. 3=21627
- Woodbury-Raman materials 3=24525
- Zeeman tuning, CaF₂:Tm³⁺ 3=9975
- CaF₂:Dy³⁺, sun pumped liquid Ne temp., 2.36 μ 3=17088
- CaF₂:Sm³⁺ laser, non-radiative transition calc. 3=20124
- CaF₂:Tm³⁺, continuous, 1.116 μ, low temp. 3=22016
- CaWO₄:Nd³⁺, harmonic generation and mixing with ruby beam in piezoelec. crystals 3=7359
- CaWO₄:Nd³⁺, 0.9 and 1.35 μ oscillations 3=25447
- CdS, use of fluorescent emission 3=526
- Cr³⁺, in ruby, radiationless transitions 3=15456
- Eu benzoylacetate solution in quartz cylinder 3=17084
- Eu thenoyltrifluoroacetate in acetone, laser threshold parameters 3=23888
- Eu³⁺ in organic matrix solid solution 3=25443
- EuR₃ (R is organic radical), by interval energy transfer, possibilities 3=17072
- GaAs, diodes, electroluminescence, mag. fields, shift, 90 kG 3=20542
- GaAs diodes, injection luminescence, band-filling model 3=20514
- GaAs, emission line narrowing, rel. to exciton binding 3=15659
- GaAs in Fabry-Perot cavities, spontaneous emission oscillations 3=24523
- GaAs injection laser, harmonic generation 3=24515
- GaAs, injection laser, quantum efficiency 3=19490
- GaAs, injection, line width, var. current 3=14808
- GaAs, interference between ends 3=24528
- GaAs, injection, quenching 3=22015
- GaAs junction, laser action 3=9982
- GaAs junction, pressure shift of coherent and incoherent emission 3=25445
- GaAs junctions, coherent emission 3=4966
- GaAs, 100° K 3=19491
- GaAs p-n junction, forward biased, stimulated emission, 77°K 3=7735
- GaAs p-n junction laser, theory 3=12351
- GaAs, room-temp. operation 3=19492
- GaAs, semiconducting diodes 3=25458
- GaAs semiconductor 3=9971
- GaAs, spectral output of "Fabry-Perot" modes 3=23052
- Ga(As_{1-x}P_x) junctions, forward biased, coherent emission, 77°K 3=7734
- GaAs_{1-x}P_x semiconducting p-n junctions 3=25377
- He-Ne and Ne, 1.15 μ 2p₁ ← 2s₁ transition, isotope shift and saturation behaviour 3=19944
- He-Ne, Brewster angle window sealing to quartz discharge tube 3=19498

Masers — contd

optical — contd

- He-Ne, continuous, near i.r. props. 3=7317
 He-Ne, continuous, using interferometer 3=17078
 He-Ne, enhancement during afterglow 3=14801
 He-Ne, Fabry-Perot ring splitting 3=22024
 He-Ne, frequency stability 3=19496
 He-Ne gas maser, optical output 3=525
 He-Ne gas masers with external mirrors 3=9985
 He/Ne, intensity, var. with pressure and relative conc. 3=14805
 He-Ne, interference fringes with long path difference 3=9608
 He-Ne, new transitions, on dominance removal 3=17090
 He-Ne, non-degenerate, with three plane mirrors 3=24530
 He-Ne, planar, Zeeman effects 3=2145
 He-Ne, power output, varying plasma length and discharge current 3=17087
 He-Ne, resonator, interferometer, isolation of 15 modes 3=9974
 He-Ne, saturation at 3.39μ 3=19497
 He-Ne, signal polarization 3=22017
 He-Ne, spectral line shape 3=11908
 He-Ne, 3.39μ 3=19495
 He-Ne transitions 3=6358
 He-Ne²², tuning dip in middle of Doppler broadened line 3=17092
 He-Xe, 2.026 μ , Zeeman tuning 3=17076
 InAs diode, mag. tunable, i.r. 3=19494
 InAs diodes, radiation width at $\sim 31000 \text{ \AA}$ 3=20452
 InP diodes, 77° to 4.2° K 3=19493
 Li-Mg-Al-SiO₂ glass, rare-earth activated, stimulated emission 3=7736
 Li-Mg-SO₃, Gd³⁺-activated glass, u.v. stimulated radiation 3=3042
 N₂, pulsed discharge, band spectrum stimulation 3=19499
 Nd, continuous-wave, room temp. 3=22014
 Nd in glass rod, far-field Fabry-Perot diffraction 3=24512
 Nd in SrF₂ 3=20482
 Nd and Yb ions in silicate glass, simultaneous action 3=7737
 Nd³⁺ glass rods, 1.06 μ 3=22008
 Ne gas maser, optical output 3=525
 Ne-He mixtures, laser effect transitions 3=22475
 SmR₂ (R is organic radical), by internal energy transfer, possibilities 3=17072
 SrF₂: Nd 3=20482
 Xe, effect of He on electron temp. and density 3=17091
 Xe, high-gain, on He addition 3=17074
 Xe, i.r., 2.5-13 μ , new freq. possibilities 3=17075
 Xe, 3.5 μ 3=24516
 Xe-He, very high gain, 3.5 μ 3=17089
 Yb and Nd ions in silicate glass, simultaneous action 3=7737

Mass spectra

See also Chemical analysis, by mass spectrometry.

- acetylene, from high-energy electron impact 3=4013
 atmosphere, 100-210 km, O-O₂-N₂ var. 3=3481
 benzene, from high-energy electron impact 3=4013
 diazirine, and appearance potl. 3=24216
 diazomethane, and appearance potl. 3=24216
 ethylene, from high-energy electron impact 3=4013
 n-heptane, from high-energy electron impact 3=4013
 ion-molecule reaction cross-sections, velocity dependence 3=14514
 methane and deuteromethanes, metastable transitions 3=25148
 multiply charged organic ions 3=1933
 neopentane, from high-energy electron impact 3=4013
 n-paraffins, fragmentation model 3=16903
 paraffins from C₁ to C₈, field ionized 3=14524
 paraffins, negative ions, secondary 3=11372
 theory 3=19375
 Ar, Aston bands, rel. to ionization 3=4020
 B₂O₃, vaporization 3=25807
 C₃H₈ 3=10549
 Ca(g) + O₂ \rightleftharpoons CaO, equil. meas. 3=3379
 CaO vapour, giving heat of vaporization 3=1875
 Fe oxide catalysts, with alkali metals, positive-ion emission 3=21891

Mass spectra — contd

- H₂O glow discharges 3=7480
 In⁺, O₂⁺, In₂O⁺, InO vapour above In₂O₃ 3=12010
 LiBO₂, vaporization 3=25807
 Mg halides, polymerization in vapour study 3=2673
 N, Aston bands, rel. to ionization 3=4020
 N₂ ions in glow discharges 3=5643
 NaBO₂, vaporization 3=25807
 O, Aston bands, rel. to ionization 3=4020
 O isotopes, relative abundances 3=12785
 O⁻ from O₂ and CO 3=12070
 S vapour, equilibrium composition 3=25805
 Sb isotopes 3=8215
 Sn isotopes 3=8215
 Te isotopes, mass spectral doublets 3=22336
 Xe-hydrocarbon ions, formation from nuclear decay 3=16183

Mass spectrometers

See also Ion optics.

- Bennet, math. analysis and improvement 3=24387
 cascade, two stage, with single magnet 3=14683
 double focusing in wide energy intervals 3=4220
 electromagnetic sep. method for radioactive sources 3=12608
 electrostatic analyser with linearly distrib. potential 3=7661
 electrostatic prism 3=453
 focus in e.m. isotope separators 3=16991
 focusing magnetic fields, parameters 3=19598
 industrial, design, response for large ion mass diff. 3=2054
 industrial, modification 3=12260
 internal standards for precision isotopic analysis 3=14686
 ion current detector to 10⁻¹⁹ A, applications 3=454
 ion paths, design calc. 3=9874
 for isotope ratio analyses 3=1407
 isotope separators, e.m., ion sources 3=16990
 monopole, r.f. elec. field between 2 electrodes 3=7660
 multiple-dispersion, resolving power improvement 3=12260
 perfect focusing 3=24390
 positive and negative-ion collection 3=21905
 relative partial pressure meas., double oven method 3=12260
 resonance, high-resolution spectrometer 3=4221
 for secondary processes study in ion source 3=16992
 spurious 19₁ peak, single-focusing, adsorbed gas explanation 3=24388
 telescopic system, with 2 cylindrical immersion lenses 3=453
 theory, accuracy of obs., 6 lectures 3=9879
 time-of-flight method for synchrotron beam 3=12051
 two-stage, for nuclear work, electronics, magnets 3=16992
 two-stage, for small impurities 3=4222
 vacuum techniques review 3=12263
 velocity modulation type, space charge effect 3=2055
 vertical focusing, in magnetic analysers 3=2052
 wide-band, with double focusing 3=19500
 C, W filament comparison 3=24391

accessories

See also Ion sources.

- appearance potl. recording circuit 3=2056
 circuits, scanning 3=14484
 c.r.t. detection, simultaneous 3=21906
 Hall generator for mass number meas. 3=14687
 ion counting photo-multiplier 3=12264
 "ion mirror", for multiple dispersion 3=21903
 ion source, negative, for analysis of residual gas 3=21012
 ion source, power supply 3=12261
 ion source, spark, d.c. 3=16989
 ion source, vacuum vibrator type, for solids 3=7659
 Ilford Q₁ plates, detector sensitivity 3=5725
 mass-abundance radiometer for single-beam spectrometer 3=21904
 photoionization, use in analytical mass spectr. 3=24392
 power supply, 500-10000 V, with variable sweep rates 3=24166
 sensitivity meas. of meas. channels for dual beam 3=2053

Mass spectrometers — contd**accessories — contd**

- vacuum-closure severance device, for use in rockets 3=3842
- vacuum technique, Ti pumps 3=16994
- for volatilization of high melting solids 3=14684

applications

- See also Chemical analysis, by mass spectrometry.
- atomic masses of nuclides, review 3=10221
- chemical equil. meas., effect of residual gases 3=3379
- for chemical reactions study 3=21902
- gas sampling through pinhole, adiabatic flow region 3=21441
- ion-molecule reactions study, temp. coeff. 3=16156
- ion profiles in low-pressure flames 3=7435
- ionization, gases, many components 3=24113
- ionization, surface, initial velo. distrib. meas. 3=24225
- Mattauch type, for solids analysis 3=21014
- metastable ion transitions, using 180° spectrometer 3=2665
- neutral particles and ions sputtered from targets, independent analysis 3=24389
- omegatron, use for press. meas. in vacuum 3=3841
- oxygen, discharge, glow, ions 3=14552
- solids, review 3=14685
- vacuum gauge, Bayard-Alpart, contamination 3=21460
- vapour pressure meas., partial, many-components 3=24113
- Cs¹³⁴, ¹³⁷ radioactive decay periods 3=22337
- O¹⁷/O¹⁸ abundance ratio, accurate formula 3=25071
- SF₆, Townsend discharge, ion identification and mobility, by time-of-flight 3=16905

Mass standards

See Standards.

Materials

- bitumens, asphaltic, penetrometer for routine testing 3=1226
- Canada balsam films, thickness meas. 3=9395
- collodion films, thickness meas. 3=9395
- epoxy resin, birefringence behaviour 3=25440
- ink, electromagnetophoresis, and chemical analysis 3=16901
- nuclear materials, handbook 3=2146
- paraffin wax, electret effects meas. 3=8566
- rhodamine B, decoloration by pH changes 3=23536
- shielding materials for neutrons and γ -rays 3=2539
- for space technology, review 3=16433
- steel, soft magnetic, prod. for British elec. generating industry 3=17015
- vacuum cathodes, anti-emission materials 3=9523
- vacuum tubes, monitoring of props. 3=9522

Mathematics

- adjoint functions and orthogonality relations 3=11666
- calculus teaching to undergraduates 3=5315
- calibration of linear scales 3=9390
- complex numbers, "slide rules" 3=5323
- crystallography, Delaunay algorithm transform. for parallelepiped quadrilateral figure 3=18231
- diffusion principles in population growth and spread of rumour 3=3642
- Dyson's conjecture 3=9
- e.m. wave propagation in ionosphere 3=16247-8
- ensemble theory, classical, functional averaging method 3=5370
- ergodic theories 3=55
- Green's distrib. associated with $[\square^m - (-\mu^2)^m]^r$ 3=5917
- Laplace operator, physical meaning 3=21192
- lattice theory and proj. geometry, Wigner's theorem 3=11687
- least squares fitting of nonlinear functions, modification 3=23732
- N-dimensional total orbital ang. momentum operator 3=18692
- non-linear problems, conference, Madison, (1962) 3=7084
- nonlinear systems, harmonic response 3=19133
- nonlinear systems of second order, stability 3=9326
- operator, covariant position, application to two-particle system 3=18699
- oscillations, theorems for finite freedom 3=7086
- packing of equal O-spheres 3=7080
- Petrov types of vacuum metric, theory 3=3713

Mathematics — contd

- pharmacological systems, models 3=3641
- point of bifurcation along sequence of Jacobi ellipsoids 3=1504
- potential functions, axisymm., calc. 3=8
- potentials and superpotentials of homogeneous ellipsoids 3=1593
- quaterionic representation of compact groups 3=7089
- retarded and time-ordered products 3=9322
- sequences, distrib. and spaces 3=3705, 10016
- Soviet, review 3=21185
- square, visualized as curvilinear curve, physical possibilities 3=1577
- stability of a non-linear system in Riemannian space 3=23729
- tensor calculus, and relativity, book 3=31
- tensor calculus, book 3=5318
- 3 + 2 de Sitter group, representations 3=18693

Matrices

- arbitrary operator, variation principles 3=22093
- compliance matrix and molecular vibrations 3=8230
- complex, simple normal forms 3=12
- continuant, analytic functions, Fourier method 3=10
- density matrices from incomplete meas. 3=18690
- diagonalizing, phenomenological matrices 3=23776
- γ -type, trace calc. on electronic computer, 3=16488
- matrix elements, spectral repres. 3=5322
- $n \times n$ Hermitian matrix, random, Brownian motion model 3=2368
- secular eqns., elementary treatment 3=10485
- t-matrix singularities after canonical transformation 3=10053
- tables for operators $O_1^{\pm 1}$, $O_4^{\pm 1}$, $O_6^{\pm 1}$, $O_8^{\pm 1}$ 3=18691

Measurement

- See also Instruments; Recording; Standards; Units; Acoustical measurement; Electrical measurement; Magnetic measurement; Mechanical measurement; Radioactivity measurement; Thermal measurement; X-ray measurement. Some specific quantities are listed separately, e.g. Calorimetry; Density measurement. Where no separate heading exists, measurement methods and instruments are included among the other entries under the heading of the appropriate quantity or subject.
- geophysical, with integrating devices, actual field variations 3=18488
- instrument calibr. systems, precision and accuracy 3=21187
- least squares method for approx., appl. to ionograms 3=11432
- line straightness, using spherical aberr. 3=16566
- parameters rel. to high pressures, elec. meas. 3=23831
- quantum operator, unitary 3=5355
- quantum theory, review 3=3742
- quantum theory, role of observer 3=23761
- quantum theory, von Neumann's theorem 3=16534
- representative size 3=21079
- visual, general theory 3=5296

errors

- See also Statistical analysis.
- calibrations, comparison of standards 3=11650
- exponential absorpt. meas., n obs. 3=5328
- framing camera photographs, image-smearing errors 3=19031
- linear codes for error correction 3=3708
- mean square, in linear systems, lower bound 3=1580
- in terms of maximum error, without considering probability 3=7082
- with thermistor instruments, effect of temp. gradient 3=19132

Mechanical measurement

- Individual quantities and instruments are listed separately, e.g., Length measurement.
- flabby material, tester for low audio and subaudio frequ. 3=3783
- flatness testing, using air gauging 3=7164
- gears, spur, transmission error meas. 3=7171
- hardness, indentation, with electron microscope 3=20759

Mechanical measurement — contd

- moment-of-inertia apparatus, slow-motion 3=21282
- non-destructive, instruments, conference 3=9391
- quantitative mapping instrument 3=1649
- plate parameters, eddy current method 3=9902
- properties of materials at high temp., furnace 3=7378
- simulation of random stress fatigue effects by minimum number of discrete stress levels 3=5403
- surface topography, interference microscope meas. 3=14324
- viscoelastic solids, dynamics props. 3=13371
- wavelength calibr. in 30-1000 μ 3=24019

Mechanical strength

See also Elasticity; Hardness.

- aggregate material, for two fracture modes 3=1243
- alloys, binary, short-range order mechanism 3=6797
- alloys with low stacking-fault energy, strengthening 3=23348
- apparatus for rupture modulus in vacuum 3=23361
- austenitic steels, strengthening 3=24383
- Capron fibres, tensile strength, rel. to double refraction 3=23045
- creep rupture data, extrapolation 3=23331
- critical rate, statistical considerations 3=25638
- diamond, cleavage 3=23362
- dynamic yield conditions, viscoplastic materials 3=11738
- flabby material, tester for low audio and subaudio frequ. 3=3783
- glass, toughening by quenching and HF etching 3=16004
- gypsum hemihydrate, and induction period of structure formation 3=8790
- metals, brittle fracture, rel. to surface structure 3=20756
- metals, static and cyclic, correlation assumptions 3=23347
- metals, time depend., theory 3=18193
- p.v.c., increase, by 1 Mc/s u.s. irradiation 3=13419
- polyacrylonitril, fibres, temp. depend. 3=23358
- polycaprolactame, fibres, temp. depend. 3=23358
- polycrystalline solids, high-temperature strength 3=13374
- polyethyleneterephthalate, fibres, temp. depend. 3=23358
- polymers, temp.-time depend. 3=20732
- polypropylene, fibres, temp. depend. 3=23358
- reactor-radiation effects on materials 3=18209
- review 3=25626
- sapphire rods, bending, effect of flame polishing 3=8780
- rel. to size of stressed zone 3=18205
- steel, criterion for thermal fatigue 3=8779
- steel, extra-soft, after quenching and ageing 3=16111
- steel, hardening techniques 3=1235
- steels, discontinuities in long-term strength curves 3=23349
- theoretical, possibility of realization 3=20709
- Al, torsion, and tensile strength—endurance relation 3=18208
- Al—Si alloy, effect of precipitation 3=13538
- Cd, polycryst., -269°-23°C meas. 3=15994
- Cu films, vacuum evap. 3=1366
- Cu, torsion, and tensile strength—endurance relation 3=18208
- Cu—(Al, Zn) solid solns. 3=23348
- Fe, at low temps., time depend. 3=18193
- Fe—Al solid soln. 3=6798
- LiF, rel. to dislocations around indentation 3=12970
- Mg/MgO, high temp. 3=15288-9
- Ni-base cast alloy, complex 3=11281
- Ni, effect of high temp. thermomechanical treatment 3=3234
- Ni, effect of thermomechanical treatment 3=8778
- PbS, effect of point-defects due to nonstoichiometry 3=25266
- W, cast, effect of recryst. anneal 3=11183
- Zn, torsion, and tensile strength—endurance relation 3=18208

compressive

- metals, up to 9×10^6 atm 3=6786

shear

- brass, α -, microscopic strain distrib. at surface 3=6799
- glasses, commercial 3=11175
- metals, under pressure, rel. to temperature 3=13375
- polymers, liquid 3=21351
- Al crystals, effect of substructure 3=23350

Mechanical strength — contd

shear — contd

- Al, modulus, rel. to stationary extended dislocations 3=25616
- Al, rel. to block misorientation angle 3=11193
- Au, single crystals, critical shear stress 3=1238
- Cu, modulus, rel. to stationary extended dislocations 3=25616
- Cu, single crystals, critical shear stress 3=1238
- Cu whiskers, effect of impurities 3=20726
- Cu—Fe mixed whiskers 3=20796
- Ho, rel. to temperature 3=11091
- In, 18° to 100°C, up to 7×10^3 kg cm⁻² pressure 3=13375
- SiC single crystal platelets, crossbending strength 3=20708
- Tb, rel. to temperature 3=11091
- Zn influence of microsegregations 3=6792
- Zn, -50° to 200°C, up to 10^6 kg cm⁻² pressure 3=13375

tensile

- capron fibres, rel. to molecular weight 3=16003
- ionic crystals, rel. to annealing temp., effect of charged dislocations 3=798
- metal foils from rolled material, testing procedure 3=5073
- metals, and mosaic block misorientation, linear rel. 3=20728
- metals, low-temp., apparatus 3=9667
- nylon threads, simultaneous axial and transverse stresses 3=18206
- polymethyl methacrylate, rel. to birefringence 3=18207
- polymethylmethacrylate, rupture factor 3=3235
- polypropylene fibres, tensile strength, rel. to double refraction 3=23045
- transition metals, rel. to neutron irradiation 3=8784
- two-phase materials, such as glass-fibre resins, review 3=1209
- whiskers, meas. technique 3=25640
- Zircaloy-2, rel. to irradiation 3=11170
- Ag, films, 35-50 μ , 100-300°C 3=6783
- Ag, rel. to O content 3=13363
- Ag, time var., low temp., anomalous, and plastic deformation 3=20729
- AgCd, order—disorder transformations 3=3328
- Al, nonhydrodynamic attenuation 3=21490
- Al, relation to endurance, and torsion 3=18208
- Al, time var., low temp., anomalous, and plastic deformation 3=20729
- Al—Mg—Si sheet, effect of heat treatment 3=6869
- Au, pure, void formation 3=13364
- Cd—Ag alloy, -196°-200°C 3=6800
- Cd, low temp. thermal cycling 3=3233
- Cd—Mg alloy, -196°-200°C 3=6800
- Cd, polycryst., -196°-200°C 3=6800
- Co whiskers 3=6801
- Co—Ni—Nb alloys 3=20724
- Cu, crystal whiskers, increase on alloying with Ag 3=20727
- Cu, films, 35-50 μ , 100-300°C 3=6783
- Cu foils 3=23353
- Cu foils, from rolled Cu 3=5073
- Cu powders, C-reduced 3=13552
- Cu, relation to endurance, and torsion 3=18208
- Cu whiskers 3=6801
- Cu—Cr (0.3%) alloy, high 3=20274
- Cu—Zr (0.12%) alloy, high 3=20274
- Fe—C alloys, lifetime under load, at high temps. 3=6791
- Fe—Cu, alloys, lifetime under load, at high temps. 3=6791
- Fe, hydro-extruded 3=1215
- Fe, rel. to neutron irradiation damage 3=6759
- Fe, tensile: yield strength, rel. to temp. and annealing 3=13349
- Fe, yield stress for two strain rates 3=15991
- LiF whiskers, effect of imperfections 3=25641
- LiF whiskers, meas. 3=25640
- Mg, low temp. thermal cycling 3=3233
- MgO, increase by dislocation introduction and SiC particle sprinkling 3=25639
- Mo, n-irradiated, increase on annealing $\leq 500^\circ\text{C}$ 3=20730
- Mo, zone-refined, 4.2°-373°K 3=1236
- NaCl, rel. to annealing temp., effect of charged dislocations 3=798

Mechanical strength — contd

tensile — contd

- NaCl whiskers, meas. 3=25640
 NaCl, CdCl₂-doped, strain ageing 3=18002
 Nb, effect of strain rate 3=1237
 Ni, grain boundary cracking 3=18195
 Ni whiskers 3=6801
 Ni—Cr alloys, increase by low-temp. annealing 3=25637
 Ni₃Fe, rel. to order 3=23352
 Ta, effect of strain rate 3=1237
 Ti—Al—Co alloys, effects of precipitation 3=18204
 Ti—Al—Co alloys, rel. to ageing 3=18354
 Ti—B—Al alloys 3=11132
 TiC—WC—Co alloys, rel. to structure 3=18184
 W, rel. to purity, in single crystals 2=25617
 WC—Co, sintered, ultimate tensile strength 3=11178
 Zn, low temp. thermal cycling 3=3233
 Zn, rel. to β -irradiation 3=8781
 Zn, relation to endurance, and torsion 3=18208
 Zn, treated with Hg, rel. to irradiation 3=20178
 Zr—Nb, neutron irradiation 3=1234

Mechanics.

See also Dynamics.

- action principle, for classical field theory 3=9324
 analogy with Fourier transform, and space inversion of quantum theory 3=3741
 angular momentum expt. for teaching 3=5398
 book, advanced math. treatment 3=1642
 classical, general theory of perturbations 3=1643
 classical, perturbation theory 3=23807
 collisions, many-body, lifetimes 3=9351
 constraints in static structures, generation and meas. 3=84
 connection with wave mechanics 3=14026
 floating of long square bar 3=23837
 fluid, dim. analysis, use of governing eqns. 3=16578
 frictional systems, general law of motion 3=1648
 and fundamental particle interaction 3=17168
 granular structure, subsidence trough, expected value 3=14073
 group theory, rel. to Lie algebra represent. 3=21194
 group theory treatment classical and relativistic 3=19
 Hamiltonians, adiabatic invariants criteria 3=390
 hypervirial theorems, appl. to free systems 3=7127
 impact, perfectly elastic, of material systems 3=1645
 Liouville eqn. and Galilei group 3=15
 non-linear phenomena, and stability criteria 3=14071
 relativistic, Lagrangian deriv. from field eqns. 3=3739
 sand ripples in the desert 3=1421
 steam—water globules interaction 3=297
 stress tensor, asymmetric, continuous medium, mechanical and e.m. fields 3=19420
 teaching, as astronautics 3=11660
 three body problem, exact solutions, different inverse power laws 3=21276
 three-body problem, Lagrange stability 3=9389

Medical science

See also Physiology; Radiation protection.

- anthropological angle to physics teaching 3=23724
 breathing; unequal distribution 3=3635
 DNA degradation by noncavitating ultrasound 3=20036
 deafness surgery, rel. to middle-ear mech. 3=3666
 dentistry, use of ultrasonics 3=16714
 forensic, use of emission analysis. 3=25853
 human heart, mathematical pulsatile model 3=3644
 human radiation hazards, review 3=3645
 human respiratory tract, air-borne particle retention 3=3643
 pharmacological systems, mathematical models 3=3641
 pulmonary CO₂ diffusion, rel. to human cardiac output meas. 3=3637
 respiratory "chemostat", cybernetic analysis 3=3636
 space flight aspects 3=16433
 surgery, use of optical masers 3=7728
 tumors, malignant, luminescence spectra 3=11618
 ultrasonic absorption, by tissue of central nervous system 3=1549

Melting

See also Zone melting and refining.

- crystals, radiation effects 3=20188

Melting — contd

- boundary motion on current heating, obs., by Peltier effect 3=19064
 deuterium, pressure—temperature eqn. 3=12000
 graphite, at very high pressure 3=9656
 hydrogens, pressure—temperature eqn. 3=12600
 ice, motion of loaded wire 3=16838
 metals, carrier mobility 3=21402
 metals, post-melting interatomic binding relationships 3=3926
 metals, thermoelectricity, thermodynamics 3=25423
 migration of liquid zone through solid 3=23408-9
 n-paraffins, crystalline, theory 3=16020
 nitrates, binary mixtures, liquidus curves 3=21618-20
 semiconductors, carrier mobility 3=21402
 semiconductor crystal, impurity distrib. in melt 3=18804-5
 semiconductors, mechanism, elec. props. during 3=21614
 by shock wave compression 3=24108
 Simon constants 3=16833
 slab, heat input on one face and insulated on other, upper and lower bounds 3=16835
 solidification, growth of spherical particles 3=11297
 solid—liq. interface, temp. distrib. and motion 3=1867
 under supercritical gas, thermodynamic study 3=21616
 tritium, pressure—temperature eqn. 3=12000
 AgNO₃, volume of fusion, press. depend. up to 10⁴ atm 3=24110
 Ag₂Se, latent heat 3=2926
 Al, fusion curve at high pressures 3=6814
 AlSb, at high pressures, fusion curve 3=14417
 As, up to 70 kbar 3=19067
 Ba, high pressure melting curve 3=16834
 Bi 3=24109
 Bi, up to 70 kbar 3=19067
 Bi—Ag alloy, liquidus curve 3=5554
 Bi—Au alloy, liquidus curve 3=5554
 Bi—Cd pair, contact, rel. to irradiation 3=15525
 Bi—Cu alloy, liquidus curves 3=5554
 Bi₂O₃—Nb₂O₅ systems, phase equil. relns. 3=6813
 Bi—Sn pair, contact, rel. to irradiation 3=15525
 CaMgSi₂O₆, diopside, curve rel. to pressure 3=9657
 Cd—CdS liquids, 700°–1250°C 3=19063
 CdSe, at 0–50 kbar pressures 3=16016
 Cd—Sn pair, contact, rel. to irradiation 3=15525
 CdTe, at 0–50 kbar pressures 3=16016
 Fe—Au alloys, liquidus—solidus relns. 3=11285
 Fe, free energy curves 3=10598
 Fe—Ir alloys, liquidus—solidus relns. 3=11285
 Fe—Os alloys, liquidus—solidus relns. 3=11285
 Fe-rich alloys, liq.—solid equil. 3=13526
 Fe—Te alloys, liquidus—solidus relns. 3=11285
 Ga 3=24109
 Ga, fusion curve at high pressures 3=6814
 GaAs, effect on elec. cond., viscosity and structure 3=5448
 GaAs, at high pressures, fusion curve 3=14417
 GaSb, at high pressures, fusion curve 3=14417
 Ge, at high pressures, fusion curve 3=14417
 Ge, solute diffusion layer 3=18804-5
 He³, liquid—solid transform. anomalous 3=3937
 He³, 0.02°–0.3°K, curve analysis 3=14437
 He⁴, curve minimum 3=21649
 Hg, liquid— α phase transition under pressure 2=18227
 HgTe, at 0–50 kbar pressures 3=16016
 InAs, effect on elec. cond., viscosity and structure 3=5448
 InAs, at high pressures, fusion curve 3=14417
 InP, at high pressures, fusion curve 3=14417
 In—Sn pair, contact, rel. to irradiation 3=15525
 Mg₂Ge₂Si₂, 250°–600°K meas. 3=13142
 Mo—Zr—C system, rel. to composition 3=23476
 NaAlSi₃O₈, albite, curve rel. to pressure 3=9657
 NaF, cryometric study of S²⁻-metal ion interactions 3=5156
 Pb—Bi pair, contact, rel. to irradiation 3=15525
 P₂O₅, kinetics 3=23420
 Sb, up to 70 kbar 3=19067
 SbBr₃ 3=23371
 SbCl₃ 3=23371
 Sc₂O₃—Ga₂O₃ system, phase equil. relns. 3=12001
 Si, solute diffusion layer 3=18804-5
 SnTe, rel. to stoichiometry 3=6604
 Te, curve up to 23 000 kg/cm² 3=19066

Melting — contd

- TiO₂ particles, in electron microscope 3=3925
 Tl, fusion curve at high pressures 3=6814
 Zn, energy change calc. 3=8395

Melting point

- alkaline earth hexaborides 3=20113
 and diffusion in solids, self, activation energy 3=20218
 electric m.p. apparatus 3=21615
 graphite, high pressure 3=6818
 ice VII, curve to 200 kbar 3=9655
 metals, and heat of sublimation, var. with electronic structure 3=20045
 metals, low-temp. phases, calculation 3=21613
 rare earth hexaborides 3=20113
 semiconductors, formula, rel. to electronic processes 3=10609
 Simon equation, 290 substances 3=19068
 AgNO₃, press. depend. up to 10⁴ atm 3=24110
 AgTlTe 3=874
 Bi, high-purity, as precision temp. standard 3=9642
 Cu[A^{IV}B^{VI}] type semiconductors 3=13513
 D₂O¹⁸ 3=14144
 Ge 3=3793
 H₂O¹⁸ 3=14144
 Li^{6,7} 3=125
 Ni, 99.95% pure 3=8359
 Ni—Cr alloys, effect of C absorption 3=3347
 Ni—Cr—Fe alloys, effect of C absorption 3=3347
 Si₂[SiO₄] 3=13485
 Si₂Si₂O₇ 3=13485
 Si 3=3793
 Sn crystallites on SiO films 3=18380
 SO₂—H₂O system 3=9663
 Tc, and periodicity for transition metals 3=7386
 XeOF₄, liquid 3=17590

Membranes

- acoustic coupling, radiation impedance 3=23982
 bending, meas. by interference, analysis 3=7153
 diffusion of ions, generalized eqns. 3=16607
 diffusion, with mixed boundary conditions 3=5418
 forced vibrations 3=21466
 gas permeability, monolayer, rel. to props. 3=5461
 vibration in air 3=5478
 vibrations of infinite composite membrane 3=21465

Mendelevium

- No entries this year

Mercury

- adsorption, by Zn, Cd and Sn, crack growth 3=20757
 arc, 5461 Å line-shape detm. 3=7578
 arc, low-press., gas-density reduction near current limit 3=4067
 arc, low-press., limiting current rel. to azim. mag. field 3=4068
 arc temp. meas., by line self-reversal 3=21595
 atom, h.f.s. and isotope shifts of spectra 3=17529
 atom, collision with diatomic mol., electronic—vibr. energy transfer 3=6433
 atom, continuous emission spectra and series limits 3=25050
 atom, resonance radiation in discharge, quenching 3=19938
 atom, ⁷¹Si state, mean lifetime meas. 3=15287
 atom, spectral line blackening in hollow cathode 3=19936
 atomic beam scattering of K and Cs atomic beams 3=2586
 atoms, excitation, by Kr, in discharge, by collisions 3=19190
 atoms, metastable, collision disorient, relax. time 3=15301
 atoms, scattering and polarization of 1-2 keV electrons 3=12780
 atoms, 6(³P₁), electrophilic character, in photosensitized reactions 3=25053
 condensation on Ni base 3=301
 discharge, d.c., in Ne—Hg vapour mixture 3=9734
 discharge, electric, hot cathode, plasma, electron density, long var. 3=19204
 discharge lamp, spectral line intensity ratios, 1 to 400 torr 3=255
 discharge, low pressure, space-charge double layers 3=19205
 discharge, positive column gradient, middle pressure 3=19210

Mercury — contd

- discharge, rare-gas, resonance radiation, radial and total intensities 3=12764
 elec. arc, low-pressure, as u.v. source 3=14329
 electrical discharge, electron number densities, a.c. and d.c. components 3=21804
 elec. discharges in, high rate of energy exchange between electrons, evidence 3=24268
 electric resist. and thermoelec. power 3=23902
 films, freshly deposited, superconducting props 3=327
 Hall effect, meas. 3=7218
 liquid, Hall effect 3=144
 liquid, Hall effect 3=16636
 liquid in evacuating tube, luminescence 3=14171-2
 liquid structure, X-ray scatt. study 3=7198
 liquid, ultrasonic propagation and viscosity 3=9457
 magnetoplasma resonance, l.f., meas. 3=8409
 mixed with A, elec. discharge, positive column gradient 3=21749
 mixed with rare gases, elec. discharge, positive column gradient 3=21749
 molecular beam prodn. 3=20034
 molten, elec. resist. and Hall effect 3=9475
 phase transitions, liquid—α and α—β 3=18227
 plasma cylindrical column, noise radiation and scattering 3=383
 plasma, dark, oscillations, 15 Mc/s 3=4160
 plasma, electron mobility, temp. var., transport cross-section effects 3=19236
 plasma oscillations, l.f. 3=4166
 positron annihil. in solid and liq. 3=12954
 resonance line (2537 Å) broadening in inert gases 3=706
 spark discharge, ion concn., time variation 3=2553
 spectrum, 1650 to 2600 Å, 20° K 3=17528
 vapour, discharges, light output 3=14536
 vapour, effusion from Knudsen cells 3=16642
 vapour, eqns. of state 3=5464
 vapour, fluorescence 3=14221
 vapour, mag. resonance by transverse paramag. Faraday effect at Larmor frequency 3=23943
 vapour pressure, correlation 3=14423
 vapour, Townsend coeffs. and Paschen's law breakdown 3=4010
 X-ray exam. 3=9438
 Zeeman effect in HgI and II 3=15286
 Hg^{193m}, ¹⁹⁴, ¹⁹⁵, ^{196m}, h.f.s., isotope and isomer shifts 3=17530
 HgII, III spark spectra in low-press. plasma 3=7609
 Hg—Ar, discharge, low-pressure positive column energy balance 3=19218
 Hg—Ar discharge, moving striations 3=12093
 Hg—inert gas, discharge 0.5 to 10 mm press., theory 3=—
 Hg—inert-gas discharges, positive column field 3=7475
 Hg—Si junctions, surface barriers 3=15598

Mercury compounds

- amalgam, electrode equilb. pot. 3=25832
 halides, Raman spectra in molten state 3=9460
 halides, Raman spectra in molten state 3=9461
 Hg amalgams, adiabatic compressibility 3=16604
 Hg halides, exciton spectra, low-temp. 3=10934
 Hg solutions, surface tension, temp. depend. 3=21340
 (Hg_{1-x}Ag_{x/2}In_{x/2})₂In₂Te₃ structural, optical, elec. props. 3=11301
 (Hg_xCd_{1-x})₂In₂Te₃ structural, optical, elec. props. 3=11301
 HgCl₂, fused, refractive index rel. to temperature 3=117
 Hg^{198,201}H, A²H—X²⁺ system, h.f.s. 3=6393
 HgH, X²⁺ term, multiplet splitting 3=6388
 HgI₂, spectra, absorbt., emission, reflection, 4-290°K, various forms 3=25462
 HgI₂ crystal excitons, spectra 3=22689
 HgI₂, luminescence, rel. to absorption 3=6669
 HgI₂, photoelectret state 3=2963
 HgI₂, exciton spectra at 4.2°K 3=2765

Mercury compounds — contd

- HgI₂, u.v. absorpt. spectrum, var. with temp. 3=10990
 HgI₂⁺, force consts. and vibr. freqn. 3=6402
 Hg—In alloy, liquid, Hall effect 3=9476
 Hg—In alloys, superconductivity 3=14453
 HgIn₂Se₄ semiconductor, prep. and props. 3=864
 HgIn₂Te₄ semiconductor, prep. and props. 3=864
 HgO, ads. of cations, anions, in dilute solns. 3=13608
 HgS, dissociation energy $D_0 < 50$ kcal/mole 3=25806
 HgS epitaxial growth on rock salt crystals 3=16048
 HgS, photoconductivity 3=17962
 α -HgS, elec. cond., photocond. and absorption of light 3=6600
 Hg₂SO₄, specific heat and entropy 3=6477
 HgSe, dispersion and effective mass 3=870
 HgSe, high-pressure phase transition 3=3253
 Hg—Sn, constitution diagram 3=13504
 Hg—Sn system, thermodynamic study 3=5116
 HgTe, diffusion with CdTe 3=17786
 HgTe, dispersion and effective mass 3=870
 HgTe, mag. susceptibility, 90–400° K 3=20563
 HgTe, melting and polymorphic transitions 3=16016
 HgTe, reflectivity and band structure 3=17979
 HgTe—In₂Te₃, structural, optical, elec. props. 3=11301
 HgTe—MnTe, elec. transport props. 3=20335
 HgTe—MnTe, zinc blende type, phase diagram 3=13543

Meson field theory

See Field theory, quantum, meson field.

Mesons

See also Atoms, mesic; Cosmic rays, mesons; Hyperons; Molecules, mesic.

- baryon—meson mass spectrum 3=7787
 beams, in cosmic-ray air showers 3=6118
 as bound states of antibaryon—baryon pairs 3=7871
 composite model as field of heaviness 3=24588
 D⁺, search for 3=6080
 D⁺, with strangeness $S=\pm 2$, search 3=6061
 η as 1⁻ meson, theory 3=601
 η , contrib to γ -p elastic scatt. 3=17233
 F₀(π - π) resonance and Pomeranchuk trajectories 3=17314
 heavy neutral pseudoscalar mesons, existence, theory 3=4450
 heavy, pseudoscalar, P_{3/2} resonances 3=10168
 intermediary, theory, symmetry and parity, Fermi coupling consts. 3=19660
 jets, statistical analysis, two-centre emission 3=7872
 K, electromagnetic structure 3=606
 K, interaction volumes 3=19632
 K, isovector, charge and K* spin 3=7920
 K, possibility of unusual statistics 3=7816
 K, as vector boson mediating decay processes 3=2228
 K⁻ mesic atoms, decay 3=6369
 K⁺ and K⁰, charge symm. test 3=15028
 K₀, electromag. form factor 3=24785
 K⁰, interference phenomena 3=17335
 K*, dynamical model 3=19577
 K* reson. model, from p exchange 3=15025
 K* resonance, Regge trajectory 3=19699
 κ , rel. to unitary symmetry strangeness-changing currents 3=24783
 Klein—Gordon equation in general relativity, scalar meson 3=19547
 M, rel. to generalization of Pomeranchuk relns 3=4446
 μ , comparison with e, by prod. in γ + p, high energy 3=22157
 μ , and e, prop. similarities 3=17297
 μ -e, distinction between using multipion resonances 3=24771
 μ , electromag. props., rel. to vector meson conversion decays 3=7827
 μ , form factors from proton scatt. 3=7875
 μ , precession freq. ratios meas. 3=10136
 μ , as Regge pole 3=22050
 μ^+ , cosmic, polarization investg. 3=6114
 μ^- , depolarization, in μ -mesic atom formation 3=4731
 μ^- , polarization, in P, F, search 3=15314
 μ^+ in solids, depolarization 3=15416
 muonic number, additive, prediction 3=5926
 nucleon coupling const. from p-p scatt. 3=19625
 ω , width, calc. 3=597

Mesons — contd

- Ω , ~1685 MeV predicted, from unitary symmetry elementary particle model 3=12396
 $\varphi\omega$ mixing 3=24784
 π , as bound nucleon—antinucleon state, models 3=17302
 π , electromag. structr. 3=4418
 π , interaction volumes 3=19632
 π , many π -meson problem 3=17310
 π , possibility of unusual statistics 3=7816
 π , resonant states, theories 3=14872
 π , simple model 3=4419
 π -systems, amplitude parity, radiative effects 3=10141
 π , three-pion system, effective ang. momentum 3=4444
 π , wave functions for four pions 3=14999
 π^\pm , momentum distrib., from pN interactions, in emulsions 3=6001
 π^0 , ang. and energy distrib. 3=2483
 π^0 , properties, prod. with strange particles 3=24764
 pseudoscalar, asympt. behaviour of vertex part 3=12479
 as Regge poles, in higher order perturbation theory, vector mesons 3=22153
 from resonance decays, relative weights, in broken-symmetry theories 3=22073
 ρ , interpretation with ξ as single meson 3=4447
 ρ , Regge trajectory, non-linearity 3=6078
 ρ , width and mass, calc. 3=597
 ρ, ω resonating states, nucleon form factors 3=10103
 scalar neutral, existence theory 3=2288
 T=0 vector meson, evidence for 3=6072
 T=1, 0 vector mesons, two sets 3=4445
 theory, in 3-dimensional isospace, with elementary resonance requirements 3=17294
 vector, charged, interaction with e.m. field, theory 3=552
 vector elementarity and scatt. 3=22152
 vector, intermediate, in $e^+ + e^- \rightarrow B^+ + B^-$, decay prods. 3=6023
 vector, longitudinally polarized, wave-functions, matrix elements, calc. 3=22154
 vector, ninth, rel. to SU₃ symm. 3=24612
 vector, rel. to Pomeranchuk trajectory 3=17295
 vector, renormalizable electrodynamics 3=12391
 vector, renormalizable, theory, using functional formalism 3=2287
 ξ , interpretation with ρ as single meson 3=4447
 ξ region, discuss. of evidence 3=10153
 ~1100 m_ec², in cosmic ray shower, five μ bundle 3=17369
- absorption**
 \bar{K} -H, \bar{K} -D discrepancy and \bar{K} -N bound state Y₀* 3=19697
 μ , range straggling in rock, 200–100 000 GeV 3=4490
 μ , relativistic, energy loss rate 3=7882
 π , in homogeneous substs. 3=12494
 π^- , in H₂, effect of D₂ contamination 3=17325
 π^- , in liq. H, moderation and capture 3=10162
 π^- in liq. H₂, time 3=19689
 π^- , in nuclear emulsion, 5.7 GeV/c 3=7906
 π^+ , stopped, counting of 3=12495
 π^- , stopped in C, star prod. 3=24781
 π^- -O¹⁶, rel. to disinteg. fragments 3=6279
- capture**
 See also Nuclear reactions due to mesons.
 K, by light nuclei, $\Sigma\pi$ system 3=6089
 K⁻, by complex nuclei, collective process 3=12697
 K⁻, by complex nuclei, hyperon resonance states 3=19871
 K⁻, in complex nuclei, mechanism 3=15217
 K⁻, by deuterium, charge independence 3=608
 K⁻, in deuterium, non-mesic processes 3=6068
 K⁻, by nucleus of mesic atom 3=10480
 μ -mesons, coupling consts. 3=4415
 $\mu, \gamma - \nu$ correlation 3=24758
 μ , review 3=4358
 μ , by Ca⁴⁰ 3=24961
 μ , by Ca⁴⁰, correction from nuclear surface effect 3=10370
 μ in H, calc., V-A theory 3=19665
 μ by Li⁶, effect of mesic atoms, h.f.s. 3=17548
 μ by O¹⁶ 3=24961
 μ^- , in He³, high-pressure 3=22160
 μ^- -mesons by He³ nuclei 3=4417
 μ^- by He⁴ 3=14997

Mesons — contd

capture — contd

- μ^- in He^4 3=17360
- μ^- in He^4 , rate 3=6026
- μ^- in He^4 , rel. to asymmetry parameter of neutrons and tritons 3=12460
- μ^- , by Ne mesoatoms 3=15218
- π , by bound H-nuclei 3=12494
- π , tool for shell model studies 3=4657
- π^- , by He^3 , Panofsky ratio 3=24770
- $\pi^- + \text{He}^4 \rightarrow t + n$ or $d + 2n$ or $p + 3n$ 3=4476

decay

- η , decay modes 3=4433
- $\eta \rightarrow 3\pi$, boson pole approx., P wave interaction effects 3=22201
- $\eta \rightarrow 3\pi$ distribution, inadequacy of simple 2π approx. 3=22188
- $\eta \rightarrow 3\pi$, mechanism 3=10166
- $\eta \rightarrow \pi^+ + \pi^- + \gamma/\eta \rightarrow \pi^+ + \pi^- + \pi^0$ branching ratio 3=12496
- η , properties and effects 3=10165
- η , rel. to quantum number assignment 3=10164
- η rel. to τ and τ' 3=12497
- η , two-photon decay rate 3=15024
- η and unitary symmetry, 4 modes, calc. 3=19690
- η^0 , conversion rel. to electron and μ electromag. props. 3=7827
- $\eta^0 \rightarrow \gamma + e^+ + e^-$ or $\gamma + \mu^+ + \mu^-$ or $2\pi + e^+ + e^-$, calc. 3=22189
- η^0 , lifetime by "Primakoff effect" 3=6076
- excited states, isotopic spin conservation, violation 3=6022
- K, CP invariance failure and K_1^0 regeneration 3=4454
- K_{E3} , charge asymm., rel. to lepton theory 3=22061
- K_{E3} , decay rates calc. 3=22069
- K_{A1} and K_{A3} , lepton ang. correl. 3=7919
- K_{E3} with $\Delta S/\Delta Q = -1$, suggestion 3=7773
- K_{E4} , rel. to isoscalar $\pi-\pi$ resonance 3=22193
- K_{E4} , rel. to $K\bar{K} \rightarrow \pi\pi$ amplitudes 3=22198
- $K \rightarrow e\nu$ and $K \rightarrow \mu\nu$, radiative corrections 3=4453
- $K \rightarrow e + \nu + \pi$, effect of $K-\pi$ resonances 3=6069
- K, leptonic, rel. to partially conserved currents 3=17332
- K, leptonic, violation of $\Delta Q = \Delta S$ rule 3=6062
- K, three-body leptonic, analysis 3=19694
- K, 3-body leptonic decays 3=22191
- K_{11} , form factors 3=12499
- K_{E3} rel. to $\Delta S = \pm \Delta Q$ rule 3=602
- K_{E3} and K_{A3} , decay, ang. correl. 3=7919
- K_{L1} , rel. to structure of $\Delta S = 1$ currents 3=7918
- $K \rightarrow \mu + \nu + \gamma$, effects of weak vector boson 3=15026
- K_1^+ and K_1^0 , decays, small branching ratio 3=7917
- K_1^+/K_1^0 ratio, rel. to $\pi-\pi$ interact. 3=12502
- $K \rightarrow 2\pi + \gamma$, final-state interact., CP invariance 3=6063
- $K \rightarrow 3\pi$, isotopic spin re-exam. 3=12501
- $K_{\pi3}$, rel. to isovector 3π wave-function 3=12482
- $K_{\pi3}$, violation of $|\Delta I| = \frac{1}{2}$ rule, model, rel. to expt. 3=6064
- K, rare modes 3=19693
- K^\pm , final state scatt. effects 3=2196
- $K^+ \rightarrow \pi^+ + \pi^0$ or $\pi^0 + \mu^+ + \nu$, ranges 3=17331
- $K^+ \rightarrow 2\pi^+ + \pi^-$ 3=604
- $K^+ \rightarrow 2\pi^0 + \pi^+$ 3=604
- $K^\pm \rightarrow 3\pi$, mechanism 3=10166
- $K^+ \rightarrow 3\pi$, $\pi\pi$ interaction 3=24786
- K^0 in K_1^0 mode, and $K_1^0-K_2^0$ mass sign 3=22194
- K_1^0 , branching ratio meas. 3=12500
- K_1^0 , neutral branching ratio meas. 3=24787
- K_1^0 - and K_2^0 -mesons 3=2317
- K_2^0 -mesons, CP invariance 3=6071
- $K_2^0 \rightarrow e^+ + \pi^- + \nu$, $\Delta I = \frac{1}{2}$ selection rule 3=4451
- K-meson pairs 3=2319
- $K\bar{K}$ resonance, decay modes 3=15015
- $K^0\bar{K}^0$ systems, beats in decay 3=15031
- $\Lambda\eta$ reson. 3=7916
- μ , appl. of ξ -limiting process 3=553
- μ , beta-decay, radiative corrections 3=12404
- μ , bound, ν non-zero rest mass effect 3=22158
- μ , bound, weak interaction theory 3=2289
- $\mu \rightarrow e$, and unitary symmetry 3=15035
- $\mu \rightarrow e + e + e$, neutrinoless, search 3=10134
- $\mu \rightarrow e + \gamma$, calc. through vector-meson intermediary 3=24614

Mesons — contd

decay — contd

- $\mu \rightarrow e + \gamma$ and $\rightarrow 3e$ processes, probability and weak interactions 3=14995
- $\mu \rightarrow e + \gamma$ and $\rightarrow e + \gamma + \gamma$, search for 3=7876
- $\mu \rightarrow e + \nu + \bar{\nu}$, in atmosphere 3=4493
- μ , electron decay, relativistic description 3=22066
- μ , electron spectrum for finite mass for muonic neutrino 3=10135
- μ , lifetime, radiative corrections to decay processes mediated by vector bosons 3=2228
- μ , radiative corrections, regulator procedure 3=591
- μ , rare modes, review 3=4358
- μ , unitary symmetry model 3=22062
- μ^+ , in emulsions, depolarization in electric field 3=7877
- μ^- , rel. to universal Fermi interact. 3=4333
- μ^- -mesic atom of paramag. metal, anomalies, search 3=2593
- neutrino role, rel. to that in β -decay 3=24687
- new unstable mesons, possible decays 3=14992
- ω^0 , conversion rel. to electron and μ electromag. props. 3=7827
- ω , decay modes 3=4433
- ω , and $\gamma-3\pi$ interaction 3=6077
- $\omega \rightarrow \pi^+ + \pi^- + \pi^0$, model, rel. to π^0 lifetime 3=601
- $\omega \rightarrow 2\pi + \gamma$, calc. 3=4448
- $\pi \rightarrow e(\mu) + \nu + \gamma$, polarization effects 3=15000
- $\pi \rightarrow \mu\nu$ and $\pi^0 \rightarrow 2\gamma$, Goldberger-Treiman formulae with Regge phase shifts 3=24759
- $\pi-\pi$ resonances, theory 3=2227
- π , radiative, rel. to neutrino mass 3=12440
- π , renormalization consts., possible exptal. det. 3=17306
- $\pi \rightarrow e + \nu + \gamma$, dispersion reln. calc. 3=7885
- π , and μ anomalous interaction, K-pair 3=17304
- $\pi-\mu$, μ -ang. distrib. 3=6029
- $\pi \rightarrow \mu + \nu$ in atmosphere 3=4493
- π^\pm , radiative corrections, vector boson radiation 3=24760
- π^\pm , β -decay probability determ. 3=6031
- π^\pm , β -decay, vector form factor 3=19666
- $\pi^+ \rightarrow e^+ + \nu + \pi^0$, 3=24761
- $\pi^+ \rightarrow \gamma + e^+ + \nu$, probability 3=6030
- $\pi^+ \rightarrow \mu^+ + e^+$, positrons ang. distrib. 3=2290
- $\pi^+ \rightarrow \pi^0 + e^+ + \nu$, branching ratio 3=17307
- $\pi^+ \rightarrow \pi^0 e^+ \nu$, e.m. correction effects 3=19667
- $\pi^- \rightarrow \pi^0 + e^- + \bar{\nu}$ for non-conserved weak current 3=17305
- $\pi^+ \rightarrow \pi^0 + e^+ + \nu$, probability 3=6030
- π^\pm , rare decay modes, detector for stopping mesons 3=24754
- $\pi^0 \rightarrow 2\gamma$, rate, assuming dissoc. into baryon-antibaryon pair 3=12480
- $\pi^0 \rightarrow 2\gamma$ rel. to $\pi^+ \rightarrow e^+ + \nu + \gamma$ 3=15001
- π^0 mean life 3=12481
- π^0 , via virtual baryon-antibaryon pair 3=17303
- ρ , conversion rel. to electron and μ electromag. props. 3=7827
- ρ , and $\gamma-3\pi$ interaction 3=6077
- $\rho \rightarrow \pi + \gamma$ and 2π , branching ratio 3=601
- ρ , radiative, theory 3=17329
- τ and τ' rel. to η 3=12497
- τ , terms cubic w.r.t. particles produced 3=550
- τ, τ' , boson pole approx., P wave interaction effects 3=22201
- three-particle, near threshold, theory 3=604
- $W \rightarrow p + \pi$, coupling consts., direct meas. 3=24594
- W^- boson $\rightarrow l^- + \nu + \gamma$, calc., for various W masses 3=14881

decay observations

- $\eta \rightarrow \gamma\gamma$ or $3\pi^0$ branching ratios 3=19691
- $\eta \rightarrow 2\gamma$ branching ratio, from $\gamma + p \rightarrow \eta + p$, 978 MeV 3=22187
- $\eta^0 \rightarrow 2\gamma$, from reson. in $\pi^- + p \rightarrow n + 2\gamma$ 3=12498
- K_{E4} , from stopping K^+ in freon 3=22192
- K^+ , meas. of K_{E3} , $K_{\mu3}$, $K_{\pi3}$, $K_{\mu2}$, etc. modes 3=6065
- $K^+ \rightarrow \pi^+ + \pi^- + e^+ + \nu$, three bubble examples 3=19695
- $K^+ \rightarrow \pi^+ + \pi^- + e^+ + \nu$ 3=4455
- K^0 , spark chamber, using relative ionization 3=17140
- $K_2^0 \rightarrow e^+ + \pi^- + \nu$, relative probability 3=4451
- K_2^0 , mean-life, direct meas. 3=4456

Mesons — contd

decay observations — contd

- $\mu \rightarrow e + \gamma$, probability meas. 3=6024
 $\mu^+ \rightarrow e^+ + e^+ + e^-$, search for 3=6025
 $\mu^+ \rightarrow e^+ + e^+ + e^-$, further search 3=17298
 ω , 2 π mode, from $\pi^- + p \rightarrow n + \pi^+ + \pi^+$, 1.7 BeV/c 3=19692
 ω^0 , neutral modes proportion 3=17328
 $\pi - \mu$, ang. distrib. of μ , anisotropy 3=10142
 $\pi^+ \rightarrow \pi^0 + e^+ + \nu$, branching ratio 3=22161
 $\pi^+ \rightarrow \pi^0 + e^+ + \nu$, rate 3=594
 $\pi^0 \rightarrow e^+ + e^- + \gamma$, lifetime 3=10143
 τ^+ decay, radiative, observation 3=7925
 τ^+ , 224 in emulsion, study 3=10167

detection, measurement

- Cherenkov rings, μ 's 3=17108
 Cherenkov rings, π 's, image intensifier 3=17109
 cosmic-ray meson telescope 3=19717
 four-counter telescope for stopping mesons 3=24754
 $\rho^0 \sim 1250$ MeV from $\pi^\pm - p$ scatt. maxima at 2 and 2.35 GeV 2=19682
 K, bubble chamber track labelling, by spark chamber triggered by Cherenkov counter 3=17339
 K, up to 5 GeV/c, Cherenkov counter design 3=4297
 μ , counter scintillation, large, liquid, pulse height 3=17100
 μ , total absorpt. scintillation detector, GeV region 3=10097
 π , up to 5 GeV/c, Cherenkov counter design 3=4297
 π^+ star spectrograph 3=17327
 π^+ , stopped-mesons counter 3=12495

effects

- Cherenkov rings produced in gas, photography 3=10081
 strange particle prod. by 4.65 BeV/c π^- 3=12507

interactions

- See also Nuclear reactions due to mesons.
 with baryon \rightarrow baryon resonance + vector meson 3=14927
 with baryons, isotopic-spin-zero reson. 3=10040
 χ exchange, rel. to ν scatt. on nucleons 3=5984
 $\rho^0 \rightarrow \pi^+ \pi^-$ resonance, existence and spin 3=10163
 heavy vector meson-photon 3=24771
 hypercharge and degeneracy rel. to isotopic spin 3=4431
 K $^+$, capture, light nuclei, $\Sigma - \pi$ pair prod., momentum peak 3=24801
 K $^-$ -d, hyperon prodn. 3=19696
 K $^-$ -d, $\Lambda \pi^- p$ and $\Sigma \pi^- p$ final states 3=7921
 K $^-$ -d, rel. to parity detm. 3=4462
 K $^-$, 500 MeV/c, with nuclear emulsion 3=603
 K $^-$, with emulsion nuclei, 800 MeV/c 3=10228
 K $^-$ in nuclear emulsions, 800 MeV/c, hypernuclei prod. 3=24789
 K $^-$, 1.3-1.5 GeV/c, hyperfragment prod., in emulsions 3=10232
 K $^-$, 1.5 GeV/c, in emulsion, hypernuclei 3=10226
 K $^-$, hypernuclei prod., at 1.5 GeV/c, in emulsion 3=15089
 K $^-$, $\Sigma \pi$ pair prod. in emulsion 3=24802
 K, exchange, and nucleon-nucleon potential 3=14974
 K* exchange model for isobar prod. 3=22199
 K-hyperon resonances 3=2320
 K (\bar{K}^0) and K $^+$, rel. to mag. moments 3=6074
 K + \bar{K} + N, from $\pi^- + p$ 3=7924
 $K\bar{K} \rightarrow \pi\pi$ amplitudes from K_e decays 3=22198
 $K\bar{K}$ resonance, decay modes 3=15015
 $K\bar{K}$ resonance and decay of T=0 vector meson 3=6072
 $K\bar{K}$ resonance, possible quantum nos. 3=15032
 $K\bar{K}$ resonance, spin and parity 3=17330
 $K\bar{K}$ resonan. width, and $\pi^- + p \rightarrow K + \bar{K} + N$ 3=17337
 K $^0\bar{K}^0$ systems, beats in decay 3=15031
 K $^0\Lambda^0$ system, resonance at 1650 MeV 3=6075
 K-N absorptive and scatt. processes 3=19696
 \bar{K} -N bound state Y_0^* and \bar{K} -H, \bar{K} -D absorpt. discrepancy 3=19697
 K-N, effect of \bar{K} -K resonance 3=12503
 K-N, \bar{K} -N, ρ and ω exchange 3=4458
 $\bar{K} + N \rightarrow \Lambda(\Sigma) + \gamma$ 3=607
 \bar{K} -N, low-energy, rel. to Y_0^* 3=24794
 K + N \rightarrow N + K + π , ang. distrib. near threshold 3=22096
 $\bar{K}N$ resonance at \bar{K}^*N threshold 3=6067
 \bar{K} -N, S-wave, as two-channel problem 3=15029
 \bar{K} -N, Ξ prodn., dispersion analysis 3=610
 \bar{K} -nucleon, S-wave, with vector mesons 3=10172

Mesons — contd

interactions — contd

- \bar{K} -N rel. to Y^* resonant states 3=7922
 K $^-$ -2N mechanism 3=24788
 K $^-$, with two-nucleon system, Y^* prod. 3=10170
 K $^-$ -p, analysis of Y_0^* (1520) 3=24793
 K $^-$ p charge exchange, particle classifications 3=14871
 K $^-$ -p, const. scattering-length analysis 3=4462
 K $^-$ -p, isobaric model at 1150 MeV/c 3=7923
 K $^+$ + p \rightarrow K $^+$ + N * , meson exchange 3=24791
 K $^+$ + p \rightarrow K $^+$ + N * , 1.96 MeV/c meas. 3=4457
 K $^+$ + p \rightarrow K 0 + p + π^+ and isobar prod., ρ exchange model 3=22200
 K $^-$ + p \rightarrow $\Lambda + \bar{K} + K$ and $\bar{K}K$ reson., spin and parity 3=17336
 K-p resonance of strangeness +1, Sakata scheme 3=4363
 K + p $\rightarrow \Sigma^+ + \pi^-$, K * resonance 3=19699
 K $^-$ + p $\rightarrow \Sigma + \pi + \pi$, infinite anomalous threshold 3=12504
 K $^-$ -p, 700-1400 MeV/c, spark chamber array for 3=24790
 K $^-$ -p, near 760 MeV/c. and 1660 MeV Y_1^* , spin 3=15030
 K $^-$ -p, at 1.15 BeV/c, systematic study 3=2321
 K $^+$, K $^-$ -p total cross-sections, 3-19 BeV/c 3=10169
 K $^-$ - π , identification of resonances 3=4447
 K πK , reson. at 726 MeV, from $\pi^- + p$ reactions 3=19698
 K $^-$ - π , M-meson, rel. to Λ prod. by \bar{K} and π 3=4446
 K $^-$ - π reson., photoprod. rel. to vector particles 3=5973
 K $^-$ - π resonance, p-wave 3=6069
 K $^-$ - π , resonance 3=15033
 K, review, recent developments, semipopular 3=17193
 K $^-$ - Σ coupling constants 3=2325
 meson-baryon, pseudoscalar, $P_{3/2}$ resonances 3=10168
 meson-baryon resonances, mass formula 3=24782
 μ^+ -mesons, depolarization in paramag. gas 3=4416
 μ , anomalous, K-pair, and π decay 3=17304
 μ , e.m., as electron, review of evidence 3=24755
 μ -e, 0.2-1.3 GeV cosmic-ray muons 3=22159
 μ -electron, electrodynamic, rel. to mass splitting 3=5925
 μ , electron-photon direct production 3=14998
 μ , in Freon bubble chambers, photonuc. interactions 3=17299
 $\gamma + \mu^+ \rightarrow X^+ + \bar{\nu}$ 3=6060
 μ^- , $\text{He}^3(\mu^-, \nu)\text{H}^3$, calc. 3=10181
 $\mu^- + \text{He}^3 \rightarrow \text{H}^3 + \nu$ 3=4417
 $\mu^- + \text{He}^3 \rightarrow \text{H}^3 + \nu$, probability 3=7883
 $\mu^- + \text{He}^3 \rightarrow \text{H}^3 + \nu$, reaction rate, final results 3=7881
 μ^- -p, radiative capture 3=14996
 μ with ψ , rel. to μ -electron mass diff. 3=593
 μ , prodn. of knock-on electrons 3=17300
 μ , single burst spectra in cosmic rays 3=19595
 multi-pion resonances and isoscalar nucleon structure 3=24710
 multi-pion resonances, spin 1 3=24771
 neutral, Chew-Mandelstam, solution 3=7874
 with nucleons, pseudoscalar 3=5930
 ω , $\bar{N}N\omega$ coupling from Regge trajectory 3=4449
 π -baryon, weak, Lagrangian with S, T and P types 3=24619
 $\pi, \geq 30$, cosmic rays, in graphite, secondary multiplicity 3=17200
 π , coupling to Pomeranchuk particle and decay width 3=10152
 $\pi^0, > 10^{19}$ eV and Auger showers, structure change 3=15060
 π^- -mesons, 2.8 BeV/c, prod. of K-mesons and hyperons 3=4461
 π and ρ , interactions with nucleons, scatt. and production amplitudes 3=562
 π^- , with C, π^0 prod., props. 3=24764
 $\pi^- + d \rightarrow n + n$ and $\gamma + n + n$, branching ratio 3=15013
 π^+ -d, rel. to $3\pi, I = 0$ resonance 3=4430
 π^- , in emulsions, neutron spectra 3=17312
 π^- -emulsion nuclei, 4.5 GeV/c, hypernuclei prodn. 3=10227
 π^- , 16 BeV in nuclear emulsions, rel. to electron pair prodn. 3=24708
 π^- , stopped in emulsions, Auger electrons 3=6038
 π^- in freon/xenon bubble chamber, 2.8 GeV/c, K 0 + \bar{K}^0 prod., reson. 3=24792
 $\pi\gamma\gamma$ coupling const. from double photoprod. expt., theory 3=10072
 $\pi^- - \text{He}^4$, 153 MeV 3=6039
 $\pi^- + \text{He}^4 \rightarrow t + n$ or $d + 2n$ or $p + 3n$ 3=4476

Mesons — contd

interactions — contd

- π , high energy, low-multiplicity jets 3=2301
 π^- in hydrogen bubble chamber, $\Sigma^-K-\pi$ resonances 3=6087
 π^- , in hydrogen, 11.4 GeV/c, Λ , K^0 prod. 3=19674
 π -hyperon resonances, spins, meas. 3=4436
 π -hyperons, with and without doublet symm. 3=7926
 $\pi-K$, identification of resonances 3=4447
 $\pi-K$, M-meson, rel. to Λ prod. by \bar{K} and π 3=4446
 πK , reson. at 726 MeV, from $\pi^- + p$ reactions 3=19698
 $\pi-K$, resonance 3=15033
 $\pi\Lambda$, Y_1^* reson., 1385 MeV, spin, from $K^- + p \rightarrow \Lambda + \pi^+ + \pi^-$ at 2.24 GeV/c 3=15037
 $\pi\Lambda$, Y_1^* reson., spin and parity, 1385 MeV, from $K^- + p \rightarrow \Lambda + \pi^+ + \pi^-$, at 1.22 GeV/c 3=15038
 $\pi-\Lambda$ resonances, proposed P-state 3=4437
 $\pi^- + n \rightarrow \pi^- + n + m\pi^0$ at 2.8 BeV/c 3=4440
 $\pi^- + n \rightarrow \pi^- + \pi^+ + p$, peaks in $\pi^-\pi^+$ system 3=2304
 $\pi^- + n \rightarrow \pi^- + \pi^+ + \pi^0 + p$, 2.8 BeV/c 3=22175
 $\pi-N$, chirality 3=7897
 $\pi-N$, const., from $n-p$ scatt. ang. distrib. 3=7866
 π -nucleon coupling constant 3=19551
 $\pi-N$ couplings, completeness of field theories 3=10012
 $\pi-N$, cross-sections, phase-shifts, resonances 3=2300
 $\pi-N$, effect of $\bar{K}-K$ resonance 3=12503
 $\pi-N$, in emulsion, relativistic secondary products 3=2482
 $\pi-N$, high-energy, rel. to "target mass" in one-meson-exchange 3=125939
 $\pi-N$, hyperon ang. distrib., rel. to parity 3=4462
 $\pi-N$, inelastic, at high energy 3=6040
 $\pi-N$, inelastic, state of particles after impact 3=12484
 $\pi^- + N \rightarrow K^0(\bar{K}^0) + Y(K,N) + m\pi$, 2.8 BeV/c, resonances 3=17315
 $\pi + N \rightarrow N + \pi + \pi$, ang. distrib. near threshold 3=22096
 $\pi + N \rightarrow N + \pi + \pi$, near threshold, theory 3=6032
 π -mesons, $\pi N \rightarrow \pi\pi N$ at 290 MeV 3=4439
 $\pi-N$, in $N-N$ scatt., at 40-310 MeV 3=14977
 $\pi-N$, production of Λ -hyperon, model 3=4467
 $\pi-N$, rel. to bootstrap mechanisms 3=24613
 $\pi-N$, rel. to jets, 10^{11} - 10^{15} eV and $N-N$ interact. 3=17364
 π -nucleon reson., photoprod., isobaric model, gauge invariance 3=10073
 $\pi-N$, resonance structure, dynamical mechanism 3=22169
 $\pi-N$, resonance spectrum, Regge trajectories, dynamical basis 3=22170
 $\pi-N$ resonances, review 3=4430
 $\pi-N$, slow π production 3=17309
 $\pi-N$, strange-particle prod. 3=19700
 $\pi-N$, upper limits, from Lehmann vertex function representation 3=19539
 $\pi^- + N \rightarrow Y_2^* + K$, Y_2^* search 3=17349
 π -nucleon, vertex functions, majorising 3=15020
 $\pi-N$ at 6.8. BeV/c 3=2302
 $\pi-N$, 16.2 GeV/c 3=8120
 π^- , with nucleons, 7 BeV 3=24772
 π with nucleons, at 7 GeV, γ production 3=7901
 $\pi-N$, 7.5 GeV, pole diagram analysis 3=24773
 π , 7.5 BeV, with nucleons, in emulsion 3=15009
 π -nucleon, up to 10 BeV, review 3=22120
 π , pairs, after photo-prod. by $\gamma + p$, low-mass anomaly 3=10151
 $\pi-\pi$ amplitudes from boundary condition model 3=19676
 $\pi\pi$ and $K\pi$ resonances 3=15015
 $\pi-\pi$, charge exchange 3=8102
 $\pi-\pi$ data from $\pi-p$ colls at 2.8 BeV 3=7902
 $\pi-\pi$, data from $\pi^- + p \rightarrow \pi^- + \pi^0 + p$ meas. 3=6045
 $\pi-\pi$, discussion 3=12485
 $\pi-\pi$ effect in $N-N$ scattering 3=17266
 $\pi-\pi$ high energy total cross-section, calc. 3=15014
 $\pi\pi$, in multiple pion prod. by πp collisions at 7 BeV 3=15018
 $\pi\pi \rightarrow K\bar{K}$, cross-section, erratum 3=17317
 $\pi^+ + \pi^- + \Lambda^0 + \bar{\Lambda}^0$, Y_1^* , \bar{Y}_1^* , $Y_1^{*-} + Y_1^{*+}$ pair prod., from $\bar{p} + p$ 3=22209
 $\pi-\pi$, low-energy resonances, p- and s- states 3=6041
 $\pi + \pi \rightarrow N + \bar{N}$, Regge poles 3=7910
 $\pi\pi \rightarrow NN$, Regge pole position, effect of spin 3=19575
 $\pi\pi \rightarrow \pi\pi$, partial wave amplitude, at threshold 3=19679
 $\pi\pi^0 \rightarrow \pi^-\pi^0$ from $\pi^-p \rightarrow \pi^-\pi^0$ 3=19678
 $\pi-\pi$, rel. to $K^+_{2\pi}/K^0_{2\pi}$ ratio 3=12502

Mesons — contd

interactions — contd

- $\pi\pi$, and $K^+ \rightarrow 3\pi$ decay process 3=24786
 $\pi-\pi$ reson., narrowness, explanation 3=22171
 $\pi-\pi$ reson., photoprod. rel. to vector particles 3=5973
 $\pi\pi$ resonance at 620 MeV, evidence 3=4434
 $\pi-\pi$ resonance, $I = 0, 1$, exponential evidence 3=4430
 $\pi-\pi$ resonance, rel. to spectral functs. and form factors 3=4418
 $\pi-\pi$ resonances, decay props., theory 3=2227
 $\pi-\pi$ resonances, ζ region 3=10153
 $\pi-\pi$ resonances, self-consistent "bootstrap" calc. 3=5973
 $\pi-\pi$ resonances, symmetry model 3=554
 $\pi-\pi$, spectrometer, mag., spark chambers 3=17326
 $\pi-\pi$, $T=0$ and $T=1$ states, phase shifts 3=7900
 $\pi-\pi$, $T=1$ and $T=0$, phase shifts 3=2310
 $\pi-\pi$, ζ and ρ resonances, masses and widths 3=5950
 $\pi^- + p \rightarrow K + \bar{K} + N$, from $K\bar{K}$ reson. width 3=17337
 $\pi^- + p \rightarrow K + \bar{K} + N$ final state 3=7924
 $\pi^- + p$ and $K\pi$ reson. at 726 MeV 3=19698
 $\pi^+ + p \rightarrow K^+ \Sigma^+$, cross-section near threshold 3=14928
 $\pi^- + p \rightarrow \Lambda^0 + K^0$ 3=6043
 $\pi^- + p \rightarrow \Lambda + K$, cross-sections 3=2320
 $\pi^- + p \rightarrow \Lambda^0 + K^0$, high pion energy 3=6069
 $\pi^- + p \rightarrow \Lambda + K^0$, rel. to ΛE parity 3=4462
 $\pi^- + p \rightarrow \Lambda + K^0$, modified K^* exchange model 3=19705
 $\pi^- + p \rightarrow \Lambda + K$, resonances 3=7912
 $\pi^- (1.15 \text{ GeV/c}) + p \rightarrow n + (2 \text{ or } 3\gamma)$, reson., and $\eta^0 \rightarrow 2\gamma$ decay 3=12498
 $\pi^- + p \rightarrow n + \pi^- + \pi^+$, 1.7 BeV/c, and ω decay, 2π mode 3=19692
 $\pi^\pm + p \rightarrow N + 2n\pi$, isotopic spin indep. 3=7808
 $\pi-p$, Panovsky ratio, by $\gamma-\gamma$ coinc. meas. 3=24769
 $\pi^- + p \rightarrow \pi^+ + \pi^+ + n$, spark chamber, low track material 3=24563
 $\pi^- + p \rightarrow \pi^- + \pi^0 + p$, peaks in $\pi^-\pi^0$ system 3=2304
 π^+ , with p, pion resonances 3=4432
 π^+ , with p, pion resonances 3=4433
 $\pi^+ + p$, single π prod., 350-1000 MeV, isobar model 3=15005
 $\pi^- + p \rightarrow \pi^- + \gamma + p$, 340 MeV meas. 3=22176
 π^- , with p, π^0 prod., props. 3=24764
 $\pi^- + p \rightarrow \pi^0 + n$, 170 MeV 3=4435
 $\pi^- + p \rightarrow m\pi^0 + n$, 7 to 8 BeV/c, charge exchange 3=2305
 $\pi^- + p \rightarrow \pi^0 + n$, charge transfer 3=7884
 $\pi^- + p \rightarrow \pi^0 + n$ and $\rightarrow \gamma + n$, branching ratio 3=15013
 π^+ at rest + $p \rightarrow \pi^0 + n$ to stopped π , ratio, in LiH, CH and CH_4 3=19677
 $\pi^- + p \rightarrow \pi^+ + n + \pi^- + \pi^+ + \pi^+$, 4 GeV/c 3=4434
 $\pi^- + p \rightarrow \pi^+ + \pi^- + n$, deviation from one-pion exchange 3=19675
 $\pi-\pi \rightarrow \pi^+\pi^-n$, f^0 resonance obs. 3=22168
 $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ and $f^0 \rightarrow \pi^+ + \pi^-$ 1260 MeV reson. 3=17313
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, high momentum transfer, Regge-pole behaviour 3=22173
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, one-pion-exchange model 3=7893
 $\pi^- + p \rightarrow \pi^+ + \pi^+ + n$, 200-700 MeV, strip approx. inapplicability 3=2295
 $\pi^- + p \rightarrow \pi^+ + \pi^- + n$, 240 MeV 3=17318
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, 360-800 MeV meas. 3=17316
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, 340 MeV meas. 3=22176
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, 2.8 BeV 3=7902
 $\pi^- + p \rightarrow \pi + \pi + N$, 3BeV/c, and $\pi-\pi$ scatt. 3=19686
 $\pi^- + p \rightarrow 2\pi + N$, 3.3 BeV, $\pi-\pi$ reson. (ρ^- , ρ^0), ang. distrib. 3=22172
 $\pi^- + p \rightarrow \pi^- + \pi^0 + p$, 340 MeV meas. 3=22176
 $\pi^+ p \rightarrow \pi^+\pi^-\pi^+p$, f^0 resonance obs. 3=22168
 $\pi^+ (1.17 \text{ GeV/c}) + p \rightarrow \pi^+ + p + \eta$, and η decay branching ratio 3=12496
 $\pi^- + p \rightarrow \pi^- + p + \pi^- + \pi^+$, 900 MeV, meas. 3=10149
 $\pi^- + p \rightarrow \pi^- + p + \pi^- + \pi^+ + \pi^0$, 4 GeV/c 3=4434
 $\pi^- p \rightarrow \pi^-\pi^0$, and $\pi^-\pi^0 \rightarrow \pi^-\omega^0$ 3=19678
 $\pi^- + p \rightarrow \Sigma + K$, cross-sections 3=2320
 $\pi^- + p \rightarrow \Sigma + K$, resonances 3=7912
 $\pi^- - p$, at 3.4 - 9.2 BeV/c 3=6042
 $\pi^- - p$, 6 GeV/c, proton momentum spectrum 3=15010
 $\pi-p$, 6.1 and 8.1 GeV/c, "glancing" interacts. 3=7899
 $\pi-p$, 6.1-18.1 GeV/c, charge exchange cross-sections 3=15011

Mesons — contd

interactions — contd

- $\pi^- + p$, 6.8 BeV/c, Λ , K^0 prod. 3=22208
 $\pi^- - p$, 7-8 BeV/c 3=2305
 $\pi^- - p$, 16 GeV/c, strange particle prodn. 3=15012
 $\pi^- - p$, 18 GeV/c, one and two pion prodn. 3=10150
 $\pi^- - p$, 276 MeV, total cross-sections 3=22177
 $\pi^- - p$, total cross-sects. at 340 MeV 3=6044
 $\pi^- - p$, at 600 MeV, in liquid H bubble chamber 3=7904
 $\pi^+ - \text{protons}$, 820-1050 MeV, single π prod. 3=7888
 $\pi^- - p$, 5 GeV, multiple particle prodn. 3=12486-7
 π^- , with protons, inelastic, 7 BeV 3=24774
 $\pi^- - p$, 7 GeV, inelastic 4=7898
 $\pi^- - p$, 7 GeV, two non-neutral secondaries 3=17311
 $\pi^- - p$, 7.2 BeV, multiple pion prod. 3=24767
 $\pi^- - p$, 7.8 GeV, hyperon prod., polarization 3=22211
 $\pi^- - p$, 7.8 GeV, Λ and K^0 production 3=24798
 $\pi - \Sigma$, $\pi - \Lambda^0$, $\pi - K$ resonances, systematization 3=22174
 $\pi \Sigma \Lambda$, upper limits, from Lehmann vertex function representation 3=15939
 π^- , strange-particle pair prodn. at 6, 11, 18 GeV/c 3=24775
 2π and 3π , rel. to π model 3=4419
 3π resonance, $I = 0$, exptl. evidence 3=4430
 π , three- π reson., model, width 3=2312
 π , three-pion system, S-wave interact. 3=12482
 π^- , on Xe, strange-particle production 3=24796
 ρ exchange model for isobar prod. 3=22199
 ρ, γ, π coupling const. det. from π^+ photoproduction 3=4421
 $\rho\gamma\pi$ coupling const. from double photoprod. expt., theory 3=10072
 ρ ($\pi - \pi$) reson., narrowness, explanation 3=22171
 ρ , Regge trajectory and $n + p \rightarrow p + n$ scatt. sharp forward peak, 2.85 GeV 3=22190
 ρ^-, ρ^0 ($\pi - \pi$) reson. ang. distrib. in $\pi^- + p \rightarrow 2\pi + N$, 3.3 BeV 3=22172
strong, Cayley octonians 3=10031
2-meson resonances, spins 3=14993
vector exchange and nucleon-nucleon scatt., 170 MeV 3=17264
vector mesons, charged, with e.m. field, theory 3=552
vector mesons in relativistic rotator theory of elementary particles 3=14884
w-baryon coupling const., calc. 3=24627
Yukawa-type interact. with hyperons 3=609

magnetic moment

- K^0 , upper limit 3=6074
 μ^- , precession technique meas. 3=19664
 μ^+ , precession technique meas. 3=19663
 μ , review 3=4358

mass

- and bosons, composition 3=17230
 $K^0 - \bar{K}^0$ difference, calc. from decay 3=6062
 K^0 and \bar{K}^0 , gravitational masses 3=6073
 $K_1^0 - K_2^0$ mass difference 3=15027
 K_1^0 and K_2^0 -meson, difference theory 3=2317
 $K_1^0 - K_2^0$ sign, proposed method of obs. by K^0 prod., scatt. and decay in K_1^0 mode 3=22194
mass spectrum, by nonlinear field theory 3=22056
 μ 3=10136
 μ , meas. of g/m and m 3=10136
 μ -electron difference, rel. to neutrino scatt. 3=578
 μ -electron mass diff. 3=593
 μ -e mass difference, 4-component neutrino theory 3=7823
 μ -e mass difference, vector meson theory 3=5926
 μ^+ , from mag. moment meas. 3=19663
 π -meson, mass diff., rel. to $K\pi_3$ decay probabilities 3=2318
 π , from N-N scatt. at 40-310 MeV 3=14977
 π^- and π^0 , from $\pi^- + p \rightarrow n + \gamma$ (or π^0), meas. 3=10144
 $\pi^+ - \pi^0$ mass difference 3=15002
 π^0 , from β -ray energy, bubble chamber 3=17249

production

- antinucleon annihil., heavy meson prod. 3=6081
in $C^{13} - p$ inelastic colls. at 660 MeV 3=4643
by central nucleus-nucleus collisions, very high energy 3=19739
cyclotron, isochronous, as meson factory 3=5778
 $d + p \rightarrow \text{He}^3 + \pi + \pi$, formation anomaly 3=17318

Mesons — contd

production — contd

- η^0 , by γ interaction with nuclear Coulomb field 3=6076
 η , by $\gamma + p$ 978 MeV 3=22187
 η^0 , photoprod., search for 3=7914
 $\gamma + \mu^+ \rightarrow X^+ + \bar{\nu}$ 3=6060
 $\gamma + \nu \rightarrow X^+ + \mu^-$ 3=6060
 $\text{He}^5 \rightarrow \text{He}^4 + p^- + \pi^-$, energy and ang. distrib. 3=6148
high-energy nuclear processes, new quantum mechanism 3=10133
K, Dalitz plot for Y^*_2 , 1385 MeV 3=4463
 K^+, K^- , cross-section, total, 3-28 GeV 1=10071
 $K^+ \Lambda^0$, photoproduction near threshold, K^* "particle" exchange approx. 3=15041
 K^+ , in $\gamma + p \rightarrow K^+ + \Lambda^0$, at low energies 3=10175
 K^+ , $\gamma + p \rightarrow K^+ + \Sigma^0$, low-energy 3=17334
K, in $\gamma + N \rightarrow Y + K$, resonance model 3=24797
K, photoprod. on N, dispersion rels. calc. 3=22196
K, by $\nu - p$ high energy interact. 3=12499
K, multiple, by high-energy neutrinos 3=22163
K, $K + N \rightarrow N + K + \pi$, ang. distrib. near threshold 3=22096
 $K^* + N$, rel. to hyperon 1815 MeV resonance 3=4420
 \bar{K}^* , in KN collisions, as vector meson 3=6067
 $K^0 \Lambda^0$ pair prodn. on compound nuclei 3=6075
K, on complex nuclei 3=22197
K-meson pairs 3=2319
K π separation by linear accelerator, r.f., 4 GeV/c, 3=19381
 K^+ and K^0 , by pions, charge symm. test 3=15028
 $\pi^- + p \rightarrow \Lambda + K$, resonances 3=7912
 $\pi^- + p \rightarrow \Sigma + K$, resonances 3=7912
K-pairs from $\pi^- - p$ interacts., 16 GeV/c 3=15012
 K^0 -mesons, by 2.8 BeV/c π^- -mesons 3=4461
 K^0 , in $\pi^- - p$ interact. at 7.8 GeV 3=24798
 K^0 , $\pi^- + p \rightarrow \Lambda + K^0$, modified K^* exchange model 3=19705
 K^0 , by $\pi^- + p$, 6.8 BeV/c 3=22208
 K^0 , by π^- interact. in hydrogen 3=19674
 K^0 , scatt. and decay in K_1^0 mode, and $K_1^0 - K_2^0$ mass sign 3=22194
 $K^0 \bar{K}^0$ and $K^0 \Lambda$ pairs from $\pi^- - p$ interactions at 7-8 BeV/c 3=2305
 $K^0 + K^0$, by π^- , 2.8 GeV/c, in freon/xenon bubble chamber, reson. 3=24792
K, by proton beam, 30 GeV, on Al, Be, Fe 3=6090
K, 800 MeV/c, from p-synchrotron, CERN, focusing 3=17333
K, from synchrotron, alternating gradient, separator, for 2.3 GeV/c 3=17000
K, from synchrotron, proton, separator, for 1.5 GeV/c 3=17001
K, proton-antiproton annihilation, statist. model 3=7858
K, in p-p collisions, 24.5 GeV/c 3=22206
"meson factories", use of accelerators 3=5775-6,8
multiple, appl. of Regge hypothesis 3=19661
multiple, fire-ball model, many-body theory 3=22156
multiple and nonlinear scalar fields 3=19592
multiple, in $\pi^- - C$ nucleus 7 GeV collisions 3=4659
multiple, in $\bar{p} - p$ annihilation 3=7873
multiple production, semi-phenomenological approach 3=12530
multiple, "two-centre-like" emission 3=7872
 μ , coherent, in Coulomb field of nucleus 3=10070
 μ , with e, by $e^+ - e^-$ collision 3=7878
 μ , from electron collisions, by e.m. interact. 3=592
 μ , intensities from $1-10^3$ GeV N-N interact. 3=4366
 μ , by neutrinos, at great depth, detection possibility 3=19608
 $\nu + Z \rightarrow \mu + \pi + Z$, in nuclear Coulomb field 3=2293
 $\mu^+ \mu^-$ pairs by ν -nuclei scatt. 3=7880
 μ , pair prodn., spin correl. 3=10137
 μ pairs, from high-energy photons and electrons, cross-sect. calc. 3=24756
 μ , pairs, in multiple particle prod., e.m. process 3=19593
 μ , pairs, in multiple particle prod., e.m. process 3=19594
 μ pairs, photoprod. in carbon, by 1000 MeV bremsstrahlung of electrons 3=7879
 ν absorption by nucleons, zero strangeness 3=4377
in NN annihilation, unitary symmetry 3=582
nucleon-nucleon collisions, high-energy, "two-centre" model 3=6019
N-N interact., 200 GeV 3=24711

Mesons — contd

production — contd

- p-emulsion nuclei interact., 26.7 GeV/c 3=6249
 peripheral model with one-pion exchange 3=2300
 photo, scalar, unitary symmetry model 3=22155
 photoproduction, analysis with isobaric model 3=7887
 photoproduction, high-energy, rel. to Regge pole hypoth. 3=19672
 π annihilation, in $\bar{p}p$ interaction 3=4391
 π , in atmosphere, from hyperon decay 3=6112
 π , charged, from nuclei, cross-sections 3=12654
 π^0 , $C^{12}(\gamma, \pi^0) C^{12}$ at 155 MeV 3=6036
 π^0 , coherent photoprod. on deuteron 3=10178
 π^+ , π^- , cross-section, total, 3-28 GeV 3=10071
 π^0 , $d + d \rightarrow He^4 + \pi^0$, upper limit search 3=15046
 π , electron prodn., improved calc. 3=4418
 π , electroprod. from nucleon 3=10145
 π , by $e + N, \rightarrow e + N + \pi$, theory 3=595
 π^0 , $e + d \rightarrow e + d + \pi^0$, dispersion theory 3=19671
 π^0 , $e + p \rightarrow e' + p + \pi^0$, meas. 3=7896
 π^+ , $e + p \rightarrow e' + n + \pi^+$, meas. 3=7896
 π factory, role in elementary particle physics 3=7886
 π , from $f^0 \rightarrow \pi^+ + \pi^-$ 1260 MeV resonance 3=17313
 π^+ , by $\gamma + p$, energies up to $(\frac{3}{2}, \frac{3}{2})$ resonance threshold 3=2294
 π^0 , $\gamma + p \rightarrow \pi^0 + p$, 0.6-1.2 BeV meas. 3=15004
 π , by high-energy μ -mesons, on nuclei 3=24768
 π K separation by linear accelerator, r.f., 4 GeV/c 3=19381
 π , mass spectra for Y^* , 1385 MeV 3=4463
 π and μ , cyclotrons 3=5781
 π , multiple, by high-energy neutrinos 3=22163
 π -mesons, in ν -N interaction 3=4429
 π , in neutrino-nucleon collisions 3=15008
 π , by $\nu + N \rightarrow N + e + \pi$, theory 3=595
 π , ν -N or $\bar{\nu}$ -N peripheral interact. model 3=7825
 π^+ , $\nu + p \rightarrow p + e^- + \pi^+$, theory 3=10148
 π^- , $\bar{\nu} + p \rightarrow p + e^+ + \pi^-$, theory 3=10148
 π^0 , in n-p collisions at 600 MeV, ang. distrib. 3=15006
 π , multiple prod., bremsstrahlung, nucleon-nucleon collisions 3=19670
 τ -mesons, in nucleon-nucleon scatt. at 9 BeV 3=4438
 π , by N-N interact., 100 GeV 1=10105
 π , single, from N-N collisions 3=10146
 π , virtual N-N intermediate states 3=10141
 π , in $N + N \rightarrow \pi + N + N$, "bipion" diagram contrib. 3=5994
 π , photonuclear, π - π interaction effects 3=15016
 π^0 , photoprod. analysis 3=19668
 π^0 in π^- -Xe collisions at 8.4 GeV/c 3=2483
 π , photoprod., dispersion relations study 3=7890
 π , photoprod., double dispersion relations 3=4426
 π photoprod., from nuclei with one nucleon outside closed shell 3=2430
 π , photoprod. study, N/D method 3=7891
 π^+ , photoproduction, ρ , γ , π coupling const. det. 3=4421
 π^+ photoprod. by polarized X-rays, 227-373 MeV 3=17308
 π^0 -mesons, photoproduction on Be, Al, Cu, Cd and Ta 3=24762
 π , photoprod. in deuterium 3=2294
 π^0 photoproduction on deuterium at 170 to 210 MeV 3=4427
 π^- , from $\gamma + d$ 3=4424
 π^+ , photoprod. in He^4 3=4425
 π^+ , photoprod., 152-162 MeV 3=2299
 π^0 , photoproduction from H 3=15003
 π^+ , photoproduction on H, cross-section energy dependence 3=4428
 π^+ , photoprod. on H, 165-212 MeV 3=6033
 π^+ photoprod. from hydrogen by 187 MeV γ -rays 3=7889
 π^0 , photoproduction in hydrogen at 200-300 MeV 3=10147
 π photoprod. on hydrogen, 550-900 MeV 3=19669
 π , photoprod. on hyperons, dispersion rels. calc. 3=22196
 π , photoprod. on nucleons, from dispersion relns. 3=22162
 π , photoprod. on nucleons, integral eqns. 3=4422
 π , photoprod. on protons, $(\gamma, 3\pi)$ effect 3=2296
 π^0 , photoproduction on protons, high partial waves 3=24763
 π , pairs, photoprod. by $\gamma + p$, low-mass anomaly 3=10151
 π , $\gamma + p \rightarrow p + \pi^+ + \pi^-$, rel. to γ - 3π vertex 3=7894
 π^+ , by $\gamma + p$ at 160-200 MeV 3=4423

Mesons — contd

production — contd

- $\pi^+ + n$ from $\gamma + p$, 200-260 MeV, fixed momentum transfer 3=22166
 $\pi^+ + n$ by $\gamma + p$, 200-450 MeV 3=22164-5
 π , $\gamma + p \rightarrow p + \pi^+ + \pi^-$, 300-800 MeV, rel. to interaction current 3=6035
 $\pi^+, \pi^0 + (n, p)$ by $\gamma + p$, surface of cross-section against photon energy and π angle, contours 3=22167
 π^0 , $\gamma + p \rightarrow p + 2\pi^0$, $(\gamma, 3\pi)$ vertex 3=7895
 π^0 , from $\gamma + p$, $\gamma + d$, low angles, 190-220 MeV 3=24766
 π^0 , $\gamma + p \rightarrow \pi^0 + p$, 0.6-1.2 BeV meas. 3=15004
 π^0 , photoprod. on protons at high energies 3=6037
 π^0 , from $\pi^- + n$ reaction at 2.8 BeV/C 3=4440
 π , soft, in π -N collisions, theory 3=22181
 π , single, static pion-nucleon model 3=24765
 π , in π -N and N-N collisions 3=17309
 π , $\pi + N \rightarrow N + \pi + \pi$, ang. distrib. near threshold 3=22098
 $\pi + N \rightarrow N + \pi + \pi$ and $\gamma + N \rightarrow N + \pi + \pi$ 3=6032
 π -mesons, $\pi N \rightarrow \pi\pi N$ at 290 MeV 3=4439
 π , from π - π scattering 3=19683
 π , in π^-p , 4-prong events 3=19674
 $\pi^+\pi^-$, in πp collisions, f^0 resonance obs. 3=22168
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, one-pion-exchange model 3=7893
 $\pi^- + p \rightarrow \pi^+ + \pi^- + n$, 240 MeV 3=17318
 $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, 360-800 MeV meas. 3=17316
 $\pi, \pi^- + p \rightarrow \pi^- + \pi^0 + p$, rel. to π - π scatt. 3=6045
 $\pi^- + p \rightarrow \pi^- + \pi^0 + p$, rel. to ρ -meson spin 3=6079
 π , single and double prod. in π^-p interact. 3=10150
 π^+ , with strange particles, from π^+p and π^+C interactions 3=24764
 π , single, from $\pi^+ + p$, 350-1000 MeV, isobar model 3=15005
 π , in π^+p collisions at 820-1050 MeV 3=7888
 π , by $\pi^- + p$ at 900 MeV 3=10149
 π , multiple prod. in πp collisions at 7 BeV 3=15018
 π , multiple, in π^-p collisions at 7.2 BeV 3=24767
 π in π -p collisions, above 10 GeV 3=4360
 π^0 , by π^- on Xe nuclei, at 2.8 BeV/c 3=15007
 π^0 , in 8.4 GeV/c π^- -Xe interact. 3=7892
 π , by proton beam, 30 GeV, on Al, Be, Fe 3=6090
 π , diffractive production by p-nucleus interaction and γ -quanta 3=15169
 π , slow, by 9 GeV protons on emulsion nuclei 3=596
 π , complex nuclei-p interacts. at 27 GeV 3=15187
 π , charged, in proton-proton collisions 3=2297
 π -mesons, in p-p and p-C interactions 3=4388
 π^+ , $p + p \rightarrow \pi^+ + p + n$, one-boson-exchange model 3=19675
 π , in p-p collisions at 735 MeV meas. 3=24724
 π , in p-p 2.9 BeV collisions, meas. rel. to theory 3=6034
 π , proton-proton collisions at 3.5 GeV 3=2260
 π , proton-proton collisions at 19.8 GeV/c 3=2259
 π , by $\bar{p} + p \rightarrow \pi^+ + \pi^- + \pi^0$ 3=10117
 π , $\bar{p} + p \rightarrow 3\pi^+ + 3\pi^- + n\pi^0$, multipion reson. 3=2258
 π in $p + \bar{p} \rightarrow 2\pi^+ + 2\pi^- + \pi^0$, asymmetry energy dependence 2=17272
 π , soft emission induced by e.m. and weak interactions, theory 3=595
 π , at threshold, with strip approx. 3=2295
 in $\bar{p}p$ annihilation, octet model 3=583
 $p-p, \gamma-p, \pi-p$ colls. 3=4430
 $Si^{29}(\gamma, \pi^-)P^{29}$, cross-sections theory and expt. 3=2430
 two-centre model, for cosmic ray jets 3=4485
 vector pairs, charged, photoprod. in nuclear Coulomb field 3=6020
 W, hypothetical vector meson, $p + p \rightarrow W + d$ 3=10112
- scattering**
 amplitude, rel. to unitarity and causality 3=4419
 elastic, cross-sects., above 10 GeV, rel. to Pomeranchuk prediction 3=4361
 inelastic processes, amplitude interference 3=6021
 K^-d , cross-sections 3=19696
 K^-N , effect of K^* and π resonances, hyperon parities 3=6034
 K^-N , elastic, Tamm-Dancoff approx. calc. 3=24795
 K -nucleon, high-energy, possible interpretations 3=22679
 K^-N , Mandelstam rep. 3=19699
 K^-N, ρ and ω reson. exchange contrib. 3=15034
 KN scattering, at large orbital momenta, with 2π exchange 3=4452
 K , in nuclei, dispersion relns. appl. 3=10369

Mesons — contd

scattering — contd

- K^0 , and π^0 , pole residue relations 3=17216
 K^+ -p, elastic, ang. distrib. shrinking, above 10 GeV 3=4360
 K^+ -protons, elastic, at 970, 1170, 1970 MeV/c 3=10171
 K^0 -proton, elastic, meas. 3=6086
 K^+ -p, low-energy, repulsion effects 3=17338
 K -p, polarizations, Regge-pole hypothesis 3=12493
 K -p scatt. amps., resonances 3=7922
 K^- -p, 700-1400 MeV/c, spark chamber array for 3=24790
 K_S^0 regeneration, rel. to CP invariance 3=4454
Low eqn., solution properties 3=5964
meson-baryon pseudoscalar $P_{3/2}$ analysis 3=17296
meson-meson, scatt. amplitude, Regge poles 3=24618
meson-nucleon, large-angle, Regge poles and asymptotic behaviour 3=14994
 μ , by Cu nuclei, 40-170 MeV/c 3=6275
 μ^- -electron, 8 GeV, meas. 3=10139
 μ -e, radiative corrections due to hard photons 3=7777
 μ , 2 BeV, in 18 in. Fe, data analysis 3=10138
 μ^+ , in metals, slowing-down by elastic collisions, theory 3=22691
 μ^- , in nuclear emulsions, elastic 3=6028
 μ -proton, calc. 3=17301
 ν -p, inelastic, 3/2 reson. in isobaric model 3=19611
 μ -protons, rel. to form factors of μ 3=7875
 μ -p, 1-2 BeV/c, elastic, meas. 3=24757
 μ -p, 12 GeV/c 3=10140
on nucleons, large angle, fermion Regge poles and asymptotics 3=19662
by nucleons, Regge pole in u channel, contrib. 3=7809
 π - α , elastic, at 300 MeV 3=10154
 π^- , by carbon, elastic, 5-15 MeV 3=6059
 π^- , by C, independent-particle model calc., 915 MeV 3=6276
 π^- , by C nuclei, 7 GeV, multiple meson prod. 3=4659
 π^- on C at 2.8 at 6.8 BeV/c 3=2481
 $C^{12} + \pi \rightarrow \pi' + 3\alpha$ 3=15219
 π^- -D, 142 MeV, elastic and inelast. 3=22179
 π -d, elastic, 142 MeV, form-factor approx. 3=22180
 π^- -d, 300 MeV 3=17322
 π -e, high energy, use of Regge poles theory 3=5987
 π , elastic, high-energy 3=6057
 π^- -He⁴, 153 MeV 3=6039
 π^- on H at 2.8 BeV/c 3=6051
 π -hyperon resonances, dispersion relns. 3=12483
 π -K, low energy resonance 3=7907
 π , and κ and N, scatt. amplitudes, vacuum Regge poles 3=24654
 π - Λ , asymmetry parameters 3=17320
 π on n, 2-20 BeV, and p-p 3=7911
 π^- , in nuclear emulsion, 5.7 GeV/c 3=7906
 π^- , scatt. by nuclei, 960 MeV/c 3=24960
 π -N, backward, effect of nucleon Regge pole 3=19681
 π -nucleon, consequences of analyticity and unitarity 3=10119
 π -N, counter coincidence system, multichannel 3=16895
 π -N diffrn. scatt. 3=6047
 π -N diffrn. scatt., dispersion theory 3=10156
 π -nucleon, dispersion relns., existence condition 3=564
 π by nucleons, dispersion relations and unitarity of S-matrix 3=5944
 π -N, empirical systematics 3=22184
 π -N, effects on π photoprod. 3=7891
 π -nucleon, effect of π - π interaction 3=599
 π -nucleon, effect of π - π interact. 3=7805
 π -N, effect of π - π interaction 3=15017
 π -N, effect of s-wave π - π interact. 3=12489
 π -nucleon, effects of biphon resonances ξ and ρ 3=10160
 π -N, elastic 3=6041
 π -N, exchange, threshold singularities 3=2316
 π -nucleon forward scatt. amplitude 3=10037
 π -N forward scatt. amp., 240-2250 MeV 3=2306
 π -N, high-energy, real part 3=5961
 π -N, $I = \frac{1}{2}$, $J = \frac{1}{2}$ state 3=2314
 π -N, low-energy, $P_{1/2}$ and S waves 3=24778
 π -N, low-energy, relativistic effect, π - π interact. 3=6046
 π -N, non-charge exchange, two vacuum poles 3=12492
 π -N, in octet model 3=19687

Mesons — contd

scattering — contd

- π N phase shift ($J = \frac{1}{2}$ $T = \frac{1}{2}$) and nucleon as Regge pole 3=14969
 π -N phase-shifts, inner Coulomb corrections 3=15021
 π -N phase shifts, s, p wave scatt. amps. 3=2308
 π -N, π - π interact. contrib. 3=10155
 π -N, Regge poles and J parity 3=7910
 π -N resonance, $J = \frac{1}{2}$, $I = \frac{1}{2}$, theory 3=12491
 π -N, in resonance region 300-1500 MeV 3=7908
 π -nucleon, S-waves, boundary-condition model 3=19685
 π -nucleon, s-wave, dispersion relns. 3=7900
 π -N, S-wave, rel. to π^0 prodn. 3=2298
 π -N, s- and p-wave detm. 3=4419
 π -N, s and p-wave, π - π contribution 3=2310
 π -N, second and third resonances rel. to cpd. states 3=22182
 π -N, soft-pion prod. and chirality conserv. 3=22181
 π -N, spin rotation coeffs. meas. 3=6048
 π -N, strip approx. and peripheral method 3=2295
 π -N, theory, and $Y^*(\pi\Lambda)$ reson. 3=17343
 π -N, total number of zeros 3=14895
 π -N, up to 500 MeV, Chew-Low theory 3=24776
 π -N, 0-30 GeV, large-angle, "compound-elastic" theory 3=7909
 π^- by nucleons at 7-8 GeV with high momentum transfer 3=600
 π -nucleon, up to 25 GeV, statist. model 3=7794
 π -mesons, on nucleons, at 2.8 BeV/C 3=4443
 π - π , amplitudes, majorising 3=15020
 π - π , diffraction character 3=7898
 π - π , elastic, asymptotic calc. 3=24780
 π - π , elastic, high-energy amplitude 3=6055
 π - π , elastic, rel. to vector particle pole diagram 3=15023
 π - π , high-energy, ladder approx. 3=2315
 π - π , including inelastic intermediate states, calc. 3=598
 π - π , l-plane, partial-wave amplitude 3=2309
 π - π , low-energy 3=19684
 π - π , low-energy eqns., resonance solns. 3=6056
 π - π , low energy, general calc. method 3=2313
 π - π , low-energy; higher partial waves 3=6052
 π - π , low-energy, self-consistent calc. 3=10157
 π - π , N/D calc. of Pomeranchuk and ρ -Regge
 π - π , near 770 MeV ρ and 1250 MeV ρ^0 reson. 3=19686
 π - π , off-shell, $T = J = 1$ state 3=4442
 π - π , partial wave amplitudes 3=15022
 π - π , p-resonance, detection expt. 3=17319
 π - π , phase shift deduction from π -N data 3=2311
 π - π and π -N, square diagram analyticity 3=17185
 π - π , π production 3=19683
 π - π resonance, isoscalar, rel. to K_{e4} decay 3=22193
 π - π , S and P-wave amplitudes from Lagrangian 3=24777
 π - π total cross-section and slope of Regge trajectory 3=19573
 π - π , 2- and 3-point functions, perturb. theory 3=5910
 π^0 , and K^0 , pole residue relations 3=17216
 π^- -p, ang. distrib. data, resonances 3=7908
 π -p, Chew-Low theory, role of CDD poles 3=19680
 π -p, comparison with p-p, using only three Regge poles 3=14983
 π -p, diffraction peak near 10 GeV, in compatibility with p-p 3=24185
 π -p, diffraction peak, non-shrinking, dispersion theories 3=17321
 π^+ -p, elastic, ang. distrib. shrinking above 10 GeV 3=4360
 π^+ by p, elastic cross-sections, 3 GeV/c, and Regge pole hypothesis 3=6050
 π^- by p, elastic, cross-sections, 3-5 GeV/c, and Regge pole hypothesis 3=6050
 π -p, elastic, rel. to vector particle pole diagram 3=15023
 π^\pm -p, elastic, 31.4 MeV, phase shifts 3=22178
 π^- -p, elastic, 300 MeV-9 GeV, forbidden collisions 3=7903
 π -p, elastic, at 310 MeV, results and analysis 3=10158-9
 π^- -p, elastic, 10 GeV/c 3=17324
 π^- -p, elastic, 7.2 BeV, 4°-28.3° ang. range 3=6058
 π^\pm -p, high energy, forward, real part, and π -N dispersion 3=22186
 π^+ -p, maxima at 2 and 2.35 GeV and ρ^0 meson ~ 1250 MeV 3=19682

Mesons — contd

scattering — contd

- π -p, non-shrinkage 3=14916
- π -p pairs from p-p collisions at 3.5 GeV, Q values 3=19624
- π -proton, $\pi^+-\pi^-$ difference, one-pion-exchange contrib. 3=4396
- π -p, polarization and charge exchange 3=6054
- π -p, polarizations, Regge-pole hypothesis 3=12493
- π -p, small shrinking and flat leading vacuum trajectory 3=19582
- π -p, study using thin-plate spark chambers 3=24565
- π -p, total cross-section, 2 to 3 BeV 3=22183
- π^- by p, total cross-sections, 2-5 BeV/c 3=6049
- π^- -proton, 152 and 226 MeV, elastic 3=4441
- π^+ -p, 265 MeV, elastic, polarization of recoil protons 3=24730
- π^+ -p, 310 MeV, phase shift analysis, modified 3=24779
- π^\pm -p, 500-1600 MeV 3=10161
- π -p, at 600 MeV, in liquid H bubble chamber 3=7904
- π -p, at 7 BeV, multiple pion prod. 3=15018
- π^- -p, at 7.2 BeV, π - π interaction 3=6053
- π^+ -p, 1.5, 2.0 and 2.5 BeV/c, elastic meas. 3=12490
- π^- -p, 7 GeV/c, differential cross-section 3=12488
- π^- -p, 7-17 BeV/c, and Regge pole theory 3=19688
- π^- -p, 7 to 20 BeV/c, elastic 3=17323
- π - π t_0 resonance and Pomeranchuk trajectory 3=17314
- π , S and P wave scatt. lengths 3=2307
- π - Σ hyperon resonance at 1404 MeV 3=12509
- π^- , on Xe, 8.4 GeV/c, π^0 prod. 3=7892
- Regge pole method and one-meson approx. 3=19571
- scalar, pair theory, Landau singularity 3=24635
- vector, and elementarity 3=22152

spin and parity

- η , from 102 charged decays 3=7913
- $f^0 \rightarrow \pi^+\pi^-$ 3=10163
- intermediary, theory 3=19660
- K^0 3=6043
- K^0 , CPT theorem 3=10010
- K^+ , pion cloud collective motion, effects 3=19553
- K^* 3=2321
- K^* , from $K^+ + p \rightarrow K^* + N^*$, meas. 3=4457
- K^* meas. from K-meson pair prod. 3=22195
- K^* , rel. to isovector K charge 3=7920
- $K\bar{K}$ resonance 3=15015
- $K\bar{K}$ resonance 3=17330
- $K-\Lambda$, experimental evidence 3=4462
- $K-\Lambda$ relative parity 3=15042
- KAN parity, from Λ decay 3=6083
- $K\bar{N}$, odd parity 3=6066
- $\Lambda\eta$ reson. 3=7916
- 2-meson resonances, spins 3=14993
- μ , isospin and law of conservation 3=6027
- μ , spin correls. in μ -pair prodn. 3=10137
- new mesons, value predictions rel. to Sakata model 3=5928
- ω , from \bar{p} -p interactions 3=2258
- φ ($K\bar{K}$ resonance) 3=17330
- π , three-pion system 3=4444
- ρ , ω , K^* , unitary symmetry basis 3=4420
- ρ , rel. to $\pi^- + p \rightarrow \pi^- + \pi^0 + p$ meas. 3=6079
- Σ, Λ , relative parity, from $\Sigma^0 \rightarrow \Lambda^0 + e^- + e^+$, Dalitz pair invariant mass spectrum 3=17346
- ζ , even spin 3=605
- ζ , from one pion exchange, erratum 3=7915

Metallurgy

See also Zone melting and refining.

- acousto-elastic effect appls. 3=23275
- Alnico, production from powder 3=5142
- annealing furnace, electron cloud 3=5136
- basic problems, conference 3=2686
- field-ion microscopy, review 3=3311
- flow meas., metal disks, refractory, u.s. test-meter 3=23490
- high-temp. microscope 3=18972
- irons, cast, graphite formation during cooling from 1000-700°C, from u.s. velo. decrease 3=23473
- metal disk, thin, lapping, technique 3=23721
- metal single crystals, oriented cutting, polishing 3=13544
- microscopy, apparatus developments 3=246
- microstructure examination, using digital computer 3=13586

Metallurgy — contd

- radioactive tracers, use in Czechoslovakia 3=6874
- remote metallography at AERE, Harwell 3=1360
- thermoelectric materials, sintering 3=3346
- steel, soft magnetic, prod. for British elec. generating industry 3=17015
- Cu, pressure-bonded, interfacial voids 3=16114
- Ge, alloying, thermal, dislocation influences 3=20901
- Si-Fe, deformation bands, by electron microscopy 3=8912

Metals

See also Alloys; Semiconductors.

- acoustic amplification 3=8354
- anomalous skin effect and n.m.r. 3=20673
- arc, spectra, effects as impurities 3=19224
- antiferromagnets, metal-insulator transition, energy band theory 3=10729
- Azbel'-Kaner cyclotron resonance 3=10638
- b.c.c., yield point, rel. to dislocation velocity 3=6788
- Bi-type lattice, electron energy spectrum, theory 3=2746
- brittle and ductile, dynamic problems in stress analysis 3=13342
- brittleness b.c.c., rel. to recrystallization 3=18214
- bubbles of inert gas in, migration and coalescence 3=25314
- carrier mobility, during melting 3=21402
- combustion, in high temp. prod. 3=21602
- conduction, electrical, temp. var., ion charge 3=20263
- corrosion, conference, London (1961) 3=6917
- corrosion, protective methods 3=6920
- creep, activation energy and volume modifications 3=5067
- creep, effect of neutron irradi., theory 3=1228
- creep, kinetics, high-temperature 3=18191
- creep, $t^{1/3}$ law 3=6794
- crystal interstitials, diffusion 3=22801
- crystal twinning, dislocation model 3=25656
- crystal vacancies, b.c.c. quenching, difficulty 3=22732
- crystal vacancies, diffusion 3=22801
- defects, single and interacting, density matrix treatment, self-consistent 3=22700
- deformation, from calorimeter, liquid-gas film 3=19058
- determination of gas content, review 3=11370
- dielectric-metal mixtures at microwave freq. 3=10868
- diffusion coeff. enhancement by plastic deformation 3=25296
- diffusion, effect of defects prod. by plastic deformation 3=15505
- diffusion, rel. to radiation 3=8457
- diffusion, review 3=12997
- diffusion, review 3=15507
- diffusion, self, crystal vacancy and interstitials, calc. 3=22801
- diffusion, strain-enhanced, dislocation and grain-boundary short-circuiting models 3=22802
- de Haas-van Alphen effect 3=25218
- discharges, d.c., in inert-gas-metal vapour mixtures 3=9734
- dislocation loop size after neutron irradi. 3=2802
- effective mass inequality rel. to low-density carrier current 3=2773
- effective mass inequality rel. to low-density carrier current 3=8408
- elastic waves, propag., long. and transverse, ~ 1 Mc/s pulse frequency 3=18891
- elasticity, verification of linear theory 3=20684
- electrical contacts, metal migration 3=9690
- electrical resistance and spin disorder, review 3=10715
- electrical resistivity of ferromagnetics at low temp., mag. contrib. 3=15532
- electro-erosion, liquid and vapour phases of products 3=20914
- electro-erosion, process dynamics 3=23488
- electromigration, review 3=22829
- electron absorption, anomalous, b.c.c. metals 3=11331
- electron emission, secondary, energy distribns. on electron bombardment at 100-1000 eV 3=12240
- electron gas, Fermi theory of interactions 3=3766
- electron microcharacteristics meas., by optical constants 3=15467
- electron-phonon interactions, rel. to lattice defects 3=22674
- electronic spectra, low-temp., papers in conference, Kiev, 1961 3=24124
- electronic structure, rel. to n.m.r. 3=23245

Metals — contd

- electrons, Green's function and spectrum analysis 3=2745
 emissivity meas. method for strip samples 3=3919
 even-valence, Fermi surface "necks" meas. 3=25243
 explosions, flash lamp induced heating, compared with electrical 3=21628
 f.c.c., mechanical properties, rel. to neutron irradi. 3=8467
 f.c.c., quenched loops stability 3=22773
 fatigue, at small amplitudes, structural changes 3=13337
 fatigue in torsion, mechanism 3=13335
 ferromagnetic, conductivity, thermal, calc., temp. var. 3=20119
 ferromagnetic, Curie-Weiss constant 3=13243
 ferromag., effective Curie-Weiss const., no. of mag. carriers 3=8666
 ferromagnetic, elastic moduli, effect of 60 c/s mag. field 3=15970
 films, absorption, light, influence of substrate expansion 3=6649
 films, absorption, light, oxidation and wavelength effects 3=17991
 films, adsorption of gases, surface potential change, meas. by static capacitor 3=9824
 films, characteristic electron-energy losses, meas. 3=5712
 films, cond. electrons m.f.p., scatt. parameter 3=15546
 films, conductivity, electrical, support effects 3=22901
 films, cyclotron resonance, model 3=6504
 films, discontinuous, elec. conduction 3=10724
 films, evaporated, surface structure, by electron microscopy of replicas 3=13559
 films, evaporation apparatus 3=5148
 films, ferromag. resonance, rel. to superficial and deep layers 3=23206
 films, fission fragment damage 3=17802
 films, growth, effect of surface energy on crystallite size 3=16134
 films, lattice strain and crystallite size 3=20332
 films, spin resonance, d.c. detection 3=15934
 films, stresses, internal, electron diff. contrast microscopy 3=20702
 films, suspended, prod. 3=23503
 films, temperature rise, rel. to electron irradi. 3=17807
 films, thin, optical absorption 3=15666
 films, ultrathin, conduction mechanism 3=15536
 films, vacuum deposition, using spring-loaded conductors 3=9524
 flaw meas., disks, refractory, u.s. testmeter 3=23490
 flaws, u.s. pulse-analysis testing 3=11302
 fracture, ductile, mechanism 3=11177
 fracture, low cycle fatigue, review 3=13376
 freezing structure, replication on diamonds 3=8811
 friction between clean surfaces in liquid Na 3=1249
 galvanomag. props., meas. at low temp. and high pressure 3=24158
 grain boundary sliding 3=17774
 halide salts of heavy metals, luminescence 3=10990
 heat radiation rel. to surface roughness 3=7385
 heat of vaporization and surface tension 3=21602
 heavy, electron diffraction by reflection, rel. to surface state 3=18403
 helicons 3=20570
 hot electrons and holes, range 3=20146
 impact, hypervelocity, shock waves 3=21486
 impurities interact. with quenched-in vacancies 3=8424
 inert gas ions range, keV, corrections, due to sticking and saturation 3=19373
 intermetallic AB₂ compounds, crystal structure, with atomic radii $r_A > r_B$ 3=20892
 ion emission, field, desorption and evaporation 3=19371
 ion emission, negative, due to Cs positive ions 3=4205
 irradiation effects, review 3=4895
 lattice, dynamics rel. to cohesion theory 3=2706
 layers of f.c.c. metals on oriented Ag, Pd, Ni films, structure 3=1371
 liquid, diffusion by isotope transfer 3=21330
 liquid, electrical properties 3=143
 liquid, flow, two-phase, vapour vol. meas., e.m. 3=14125
 liquid, flowing in annulus, unilateral heat transfer 3=7366
 liquid, fluidity and prefreezing cluster formation 3=9437
 liquid, Hall effect meas. 3=7218
 liquid, heat conduction, neutron scatt. study 3=12462

Metals — contd

- liquid, heat transfer bibliography 3=7364
 liquid, ionization-equilibrium eqn. of state 3=3590
 liquid, monatomic, ions, long-range osc. interactions 3=9439
 liquid, surface tension 3=121
 liquid, surface tension, depend. on temp., calc. 3=7194
 liquid, thermoelectric power of 10 elements 3=145
 liquid, transverse transport coeff., 0.1% Au amalgam 3=3814
 low-temp. tensile deform., thermal props., apparatus 3=9667
 M_{2,3} emission bands of 3d metals 3=8605
 magnetic moments, localized, temp. var. 3=15725
 magnetism, review, particular reference to Frenkel's early work, 3=22888
 magnetoacoustic resonant damping of u.s. and spiral waves 3=20089
 magnetoplasma resonance, l.f., meas. method 3=8409
 magneto-polarized, elastic wave propag., dynamic elastic moduli 3=25606
 mechanical strength, static and cyclic, correlation assumptions 3=23347
 melting point and heat of sublimation, bond strength, inter-atomic, var. with electronic structure 3=20045
 metal-liquid heat transfer, Kapitza temp. jump, effect of cond. electrons 3=15451
 metal-semicond. contact, Schottky barrier meas. 3=10847
 metal-semicond. systems, barrier height studies 3=25387
 metallic oxides, reflection, 300-1000 mμ 3=13154
 metals and alloys, shear waves, finite amplitude 3=25182
 microtome sections, structure 3=18425
 molten, temp. variation of u.s. vel. and adiabatic compressibility 3=7204
 Nernst figure of merit, optimization criteria 3=20257
 neutron diff., "null matrix" method 3=13585
 noble, eqns. of state, rel. to compression data 3=22670
 noble, Fermi surface 3=8915
 noble metals, Fermi surface dimensions, from magneto-acoustic effect 3=2759
 noble, recovery from irradi., deformation, quenching 3=23345
 optical const., polarimetric method 3=11943
 oxidation 3=20984
 oxide film growth, kinetics, formulation and numerical solutions 3=25775
 particle size and strain broadening separation, rel. to cold-working 3=25754
 photoelectric effect, X-ray, cathodes, secondary emission effects 3=19310
 physical props. at high frequencies, review 3=6448
 plastic deformation, cyclic, meas. 3=13347
 plastic deformation, discontinuous, and deform. rate dependence anomalies 3=23317-18
 plastic deformation, initial stages 3=20711
 plastic deformation, low temp., thermal activation energies 3=25622
 plastic deformation, mechanism, theory 3=15987
 plastic deformation, stress-strain law, f.c.c. metals 3=11158
 plastic flow under shear, apparatus for meas. 3=11164
 point-defect annealing, theory 3=22727
 point defect investig., by precision density meas. 3=22722
 point defects, kinetic eqns. 3=22719
 point defects, radiation production and annealing 3=22723
 powder interdiffusion, X-ray diff. method 3=2822
 preferred orientation during freezing 3=1269
 pure, post-melting interatomic binding relationships 3=3926
 pure, review of physical props.
 radiation damage, nature 3=8466
 radioactive aerosols, coagulation and scavenging 3=8885
 rapidly-cooled specimen production device 3=20911
 resistance, electrical, and work function, effect of scattering, surface, Ar ions, 30 keV, ang. distrib. 3=5720
 secondary recrystallization, in polycrystals, with macroscopic pores 3=3336
 shocked state, thermodynamic description 3=9547

Metals — contd

- single crystals, oriented cutting, polishing 3=13544
 - specific heat, emissivity, sorption meas. by controlled flash heating of filaments 3=7379
 - spectrochemical analysis, by spark, h.f., surface phenomena. 3=25844
 - spin interactions between magnetic ions or nuclei 3=8652
 - sputtering of b.c.c. single crystals, spatial distrib. of ejected atoms 3=10704
 - sputtering yield, Ar + ions, medium energy 3=14678
 - sputtering of Cu, hollow-cathode Ar discharge 3=16988
 - in stars, deficiency in population II 3=13908
 - in stars, high abundance, Fe, Sr 3=18641
 - in stars, particles, prod. absorption bands 3=13909
 - static skin effect, in strong mag. field 3=25223
 - stress, friction, and yield point for b.c.c. metals 3=8765
 - stresses, vibratory, effects 3=13377
 - superconducting, transition temps. and abs. boiling points, empirical laws 3=24132
 - surface, double layer, dipole moment 3=15470
 - surface mag. props. from ortho-para H conversion 3=1128
 - surface potential barrier to electrons, meas. 3=1936
 - surface tension and heat of vaporization 3=21602
 - surface texture, Zn, effect on spreading of liquid Hg 3=5427
 - tetragonal, lattice parameters, by graphical extrapolation 3=6837
 - thermal expansion, Grüneisen's const., low temp. var. 3=15446
 - thermionic emission, electrons and positive ions, laser induced 3=24333
 - thermionic emission, refractory, in Cs vapour, low coverage, discontinuity 3=14625
 - thermoelectric power 3=20422
 - thin layers, electric and magnetic props., conference, Liège (1961) 3=13029
 - twinning rel. to martensite formation, temperatures 3=11288
 - ultrasonic absorption, in elec. and mag. fields 3=2722
 - vacancy clustering, rel. to impurities 3=17708
 - vaporization, enhancement of diffusion-limited rates 3=24120
 - vapours, oriented atoms, birefringence effects 3=4714
 - velocity of sound, mag. field effect 3=15432
 - viscosity activation energy, high temp., liquid 3=21602
 - X-ray spectra, absorption, fine structure 3=6657
 - X-ray spectra, K-series, rel. to pre-excitation of interacting electrons 3=25471
 - yield plateau on stress-strain diagrams, nature 3=5062
 - yield strength, grain size depend., preferred orient. effect 3=25628
 - Cs-coated, electron reflection 3=21889
 - NH soln., e.s.r., effect of adding electrolyte 3=11811
- theory**
 See also Crystals; Plasma.
- acoustic amplific., resonant, by cond. electrons 3=20093
 - acoustic wave propag. in mag. field, oscillations 3=4129
 - acoustic waves, phase velocity calc. 3=4820
 - acoustoelectric effect, magnetic-field dependence 3=10591
 - adsorption and surface energy 3=23517-18
 - anisotropic, conduction electrons, Boltzmann eqn. 3=25227
 - antiferromagnetism → ferromag. transition 3=13227
 - atom displacement by electrons, threshold energy 3=10700
 - b.c.c., electrostatic coupling coeffs. 3=20050
 - bond strength, interatomic, var. with electronic structure 3=20045
 - bound states of two electrons 3=22675
 - cohesive props. 3=8329
 - compressed form of Groups IV, III—V and II—VI substs. 3=12895
 - conduction electrons scatt. 3=8384
 - conductivity, electrical and thermal, effect of e—e scatt. 3=20265
 - crack propag. in liquid metal environment 3=11185
 - creep and rupture stresses, from eqn. of state 3=8761
 - cyclotron resonance, quantum theory 3=15477
 - deformation ageing, general theory 3=20723
 - diamagnetic shielding of nuclei, on Bloch model 3=2750
 - diamagnetism of cond. electrons 3=25500
 - diamond, metallic 3=12895
 - dislocation stresses, Thomas—Fermi model 3=2801

Metals — contd

theory — contd

- elastic consts., temp. depend., electron contrib. 3=25603
- elasticity theory, quadratic, and electron density 3=5053
- elec. conductivity, effect of low-concn. impurities 3=4902
- electrical conduction, Boltzmann eqn. for inhomog. elec. fields 3=13030
- electrical conduction, transverse, rel. to electron and phonon mutual dragging 3=4901
- e.m. wave extinction theorem, plasma theory 3=17049
- electron, dispersion effects 3=25218
- electron emission, secondary, due to H⁺, H, He⁺, He 3=7638
- electron emission, secondary, free electron model 3=4184
- electron energy loss for fast nonrelativistic electrons 3=4855
- electron gas, effect of Coulomb correl. 3=15466
- electron gas, review 3=12953
- electron interaction effects on props. 3=753
- electron kinetic eqn., many-phonon corrections 3=15454
- electron mean-free-path rel. to thin-sample resist. 3=6561
- electron and neutron irradi. effects, theory 3=4897
- electron oscillations, zero-sound type 3=25262
- electron-phonon interact. for one-electron states 3=10588
- electron-phonon system, kinetic eqns. 3=25249
- electron-phonon systems, frequ.-depend. relax. 3=25250
- electron surface collisions, Fermi liq. theory 3=25245
- electronic and atomic props., from first princs. 3=8394
- electrons and holes, hot, m.f.p., films, photoelectric emission 3=20264
- emissive power, thermal, rel. to optical constants 3=286
- ferromagnetic, elec. conduct., anomalies 3=10716
- field emission in mag. field 3=16973
- films, plasma reson. due to fast electron 3=8407
- focusing collision chains in h.c.p. metals 3=22883
- free electrons, almost, approx., appls. 3=15452
- hard-metals, refractory, bonding 3=10567
- heat transfer at interface, directional theory 3=1846
- hot electrons, range in real metals 3=15462
- hyperfine field 3=8342
- impurity diffusion, saddle-point config. 3=2789
- indirect exchange, magnetic order and electron-band structure 3=15406
- Kohn effect and lattice vibration frequency distribution 3=12917
- lattice dynamics by axially symm. model 3=2711
- liquid, electron correl. effect on elec. resistivity 3=23903
- liquid, electronic structure, "wave vector" model 3=23901
- liquid, electronic transport and states, review 3=21401
- magnetic ground state rel. to Fermi surface 3=3094
- magnetic moment localization around impurity 3=20136
- magnetoacoustic effect, quantum, rel. to electron spin 3=15429
- magnetolectric coeffs., qualitative study 3=10713
- magnetoplasma oscill. for anomalous skin effect 3=8411
- melting points calc. for low-temp. phases 3=21613
- fatigue, from standpoint of growing crack 3=20746
- magnetic, resistivity anomalies, electron spin-dependent scatt. 3=25319
- magnetolectric effects, effect of compensation 3=25330
- monovalent, electrons spatial distrib. round impurity 3=8385
- neutron scattering, cold, lattice theories 3=4823
- noble, electron redistrib. by point defects 3=15463
- noble metals, relaxation time of conduction electrons in 3=25228
- noble, stacking fault tetrahedra, effects 3=12994
- nuclear acoustic resonance absorption 3=20088
- nuclear spin coupling, exchange-type 3=5360
- paramagnetism, electron spin 3=15756
- phonon spectra, Kohn anomalies 3=25190
- phonons, long-wavelength, magnetic depend. 3=4808
- photoelectric two-photon surface effect, theory 3=6625
- photoelectricity, inner, and free electrons 3=22897
- plasmon oscills., surface, foil, dispersion calc., semi-classical hydrodynamic 3=22690
- positron annihilation rel. to two-body correl. 3=8412
- proton and μ^+ slowing-down, theory 3=22691
- rare-earth metals, indirect exchange interactions 3=10642

Metals — contd**theory — contd**

- residual resistivity due to defect pairs 3=8486
- review, particular reference to Frenkel's early work 3=22888
- Rydberg function as interatomic potential 3=4800
- semimetals, magnetoresistance oscillations in strong mag. fields 3=6569
- sound absorption in mag. field, quantum theory 3=4813
- sound reflection, maximum at critical angle, theory 3=8355
- specific heat, calc. 3=753
- specific heat in mag. field, electronic contrib. 3=22664
- spin—lattice relax., electron—electron interact. effect 3=23266
- stacking faults, electrical resistance, face-centred cubic metals 3=15533
- surface energy of foils, thickness depend. 3=10573
- surface impedance and transparency in i.r. 3=20434
- thermal props. by functional variational princs. 3=752
- transition, electron theory, review 3=17676
- transverse conductivity, zero-freq. limit 3=4848
- tunnel contact current, quantum oscill. in mag. field 3=22908
- tunnelling between normal metal and superconductor, function tables 3=16863
- u.s. absorption in mag. field, frequ. variation 3=22653
- u.s. attenuation 3=22651
- u.s. attenuation in mag. field, quantum effects 3=4816
- vacancies using electron theory of metals 3=8390
- vacancy—impurity pairs in metals, elec. resistivity, calc. 3=25320
- wires, thin, optical rel. to plasma props. 3=13159
- X-ray emission, characteristic, comp. of theory and expt. 3=13193
- Ag, interaction forces rel. to vibr. spectrum 3=2716
- Ag, optical constants, electron theory 3=2986
- Bi-type, free carrier number, high temp. 3=25225
- Cu, optical constants, electron theory 3=2986
- Cu, vibr. spectrum by Dayal's method 3=2713
- Li, compressibility, rel. to exchange charge volume 3=23282
- Na, compressibility, rel. to exchange charge volume 3=23282
- Na, electron mass shift calc. 3=10588
- Sn, grey, valence band, l.c.b.o. method 3=779
- Zn, Fermi surface, magnetoelec. data 3=12945
- Zn, props. calc. from first principles 3=8395

Meteorological instruments

- See also Anemometers; Hygrometers; Ionosphere measuring apparatus.
- chemiluminescent rocket payloads, for wind study, night, upper atmosphere. 3=25918
- constant level balloons 3=3450
- evaporimeters, pan, Piche and mesh covered, comparison 3=21030
- indirect probing techniques using radar 3=5188
- radiosonde, C-type, radiation and lag errors 3=11389
- radiosonde, Finnish, recording methods 3=3447
- radiosondes, Indian, radiation error, upper troposphere 3=18205
- satellites, use 3=5189
- Schott filters, lower cutoff rel. to temp. 3=9606
- thermometer, rain, thermistor 3=13656
- tower, 1400 ft., with auto data readout 3=5190
- vertical sounding techniques 3=3448

Meteorology

See also Weather.

- depression centres and jet current wave origins 3=11387
- extremes, application of envelopes for ordered observations 3=13657
- fluid stratified, appl. 3=5405
- i.r. flux & surf. temp. from Tiros II meas. 3=1411
- method of similarity, dimensional analysis 3=9016
- numerical forecasting, use of smoothing operators 3=5191
- pressure, numerical forecast 3=3452
- profile and eddy flux adjustments 3=21031
- radar equation deriv. 3=5192
- radioactivity, natural, correlation 3=18520
- and radioactivity, Rn, conc. 3=21042
- radon concn. above Atlantic, effect of weather 3=9052

Meteorology — contd

- satellite studies, non-Russian, review 3=18492
- scatterers, velocities, radar meas. 3=16206
- small scale research in Japan 3=11391
- solar radiation absorpt., spectr. meas. 3=1434
- statistical extrapolation of fields, practical 3=3451
- thermal data from satellite radiometry. 3=25865
- thermohydrodynamic eqns. for forecasting 3=1427
- very long range prediction 3=14108

Meteors

- activity correl. with rain fall intensity peaks 3=6958
- air currents in meteor zone 3=11520
- australites, origin in meteorite crater 3=3563
- australites, Th and U content by α -counting 3=7025
- Brewster meteorite, mag. props. 3=7026
- bright photographic, densities calc. 3=3557
- cameras, meniscus Schmidt 3=16319
- chondrites, γ -spectroscopic studies 3=3558
- composition and origin, review 3=16366
- deposition on Antarctic ice cap 3=13872
- dust, rocket and satellite data 3=21064
- e.m. wave scattering, on trails 3=19448
- earth ocean basins and lopoliths, lunar maria, impact formation? 3=11384
- and earth, rotation axis changes on collision 3=21022
- fragmentation analysis 3=16364
- fragmentation, effect on mass distrib. data 3=5251
- history, and ambient Xenon 3=11525
- impacts, on earth and moon, frequency versus mass for stoney and Fe meteors 3=13874
- incoming rate, lunar effect 3=13777
- influx, rel. to dust concn. in atmos. 3=3469
- and interplanetary matter, Fe_2O_3 , accumulation on earth 3=18593
- ionized trails, e.m. wave scatt. 3=25984
- jumping-film camera, for meteor photography 3=11488
- Leonid spectrum, Nov. 15-16, 1961 3=9184
- luminosity and ionization 3=5252
- magnetic effects, mechanism for 3=13844
- Mercury, erosion 3=16352
- meteor dust, space vehicle study 3=3555
- meteoric particles, steady-state space distrib. 3=7023
- meteorite St. Margaret, June 1962, compn. 3=3559
- meteorite Nedagolla, dendritic structure 3=7027
- meteorites, ages by radioactive decay, rel. to cosmology theories 3=7017
- meteorites, Bruderheim, chondrules, excess Xe 3=11524
- meteorites, chondrite phase composition 3=9186
- meteorites, cosmogenic nuclide prodn., rel. to spallation by 3BeV protons 3=8101
- meteorites, K—Ar ages, rel. to gravitation interaction decrease 3=11523
- meteorites, rare-earth element isotope abundances 3=13875
- meteorites of short cosmic-ray exposure age 3=3560
- meteorites, Sikhote Alin iron meteorite 3=11528
- meteorites, sputtering by 20 keV A^+ ions rel. to space erosion 3=1516
- meteorites, stony, remanent magnetization, possible origin 3=11065
- meteorites, transitional aerodynamic drag 3=13776
- meteorites, Zn and Hf abundances 3=11527
- micro, collisions with needles, West Ford 3=25994
- moon impact and earth atmospheric ice nuclei 3=21038
- as petroleum deposit source 3=9185
- Phoenicid shower, 5th December 1956 3=3556
- radar echoes, 1961 results 3=9273
- radioastronomy, echoes, Brysk analysis, criticism 3=16427
- radio echo from trails, asymmetric model 3=11599
- radio echoes, 300 Mc/s, interpretation 3=13925
- radio scatt., Eshleman's model modification 3=23709
- radiosignal reflections, decay rates 3=13924
- radio wave scatt. by trails, theory 3=11587
- rates in southern hemisphere, one-year survey 3=13873
- scattering echo, over-dense ionization column 3=16428
- spectrum, wake, Leonid 3=16365
- sputtering rate under solar-wind bombardment 3=23667
- stone, He and Ne contents, rel. to ages 3=13877

Meteors — contd

- tektites, cosmic-ray exposure history, rel. to origin 3=1515
- tektites, formation, cometary mech. 3=11522
- tektites, origin 3=13878
- tektites, origin by O isotope studies 3=9014
- tektites, parent body origin hypothesis 3=3562
- tektites, theories of origin 3=3561
- tectonic radioactivity, age, using Pb isotopes 3=7024
- trails, radio wave scattering 3=7049
- trials in lower ionosphere, wind distortion 3=16277
- Tungus meteorite, height of explosion 3=16367
- velocity, extra-atmospheric, det. from photogr. records 3=5220
- B abundance and D^{11}/D^{10} ratio, and in earth 3=13876
- Fe meteorites, Ar³⁹/Cl³⁸ ratio rel. to age 3=4491
- Fe, meteoritic, thermal properties 3=11526

Mica

- biotite, Fe⁵⁷ Mössbauer absorption 3=4802
- charged particle tracks, electron micr. study 3=2842
- crystal dislocations, multiple electron diffr. contrast obs. 3=20189
- growth study, by decoration with PbS 3=16050
- muscovite, Ar and air ion-bombardment effects 3=17806
- muscovite, correl. of various optical props. 3=25463
- muscovite, vibrations of OH ions 3=13164
- particle tracks, u fission, fossil 3=6948
- particles track visualization, fission, use in radioactive dating 3=5907
- polymorphism and diffr. props., theory 3=13482
- U-concentration meas. by fission tracks 3=21020

Micrometry

See also Interferometry; Strain gauges; Thickness measurement.

- microscope screw calibration, interferometric 3=21524

Microphones

See also Acoustic transducers.

- calibration, statistical detection of errors 3=9568
- condenser, calibr. by thermophone method 3=7286
- condenser, with probe tube, frequ. response 3=1782
- condenser, self-biased, high capacitance 3=3859
- electrostatic, with foil electrets 3=23979
- hydrophones, early models 3=14277
- objective, transfer function, interferometric meas. 3=11937
- pressure calibration 3=11869
- pressure-gradient, calibration, free-field evaluation 3=1781
- vibration response rel. to noise data 3=14282

Microscopes

See also Electron microscopes; Ion microscopes.

- coincidence split image eyepiece 3=18971
- dissecting type, continuous focusing 3=16754
- high-temp., metallurgical applications 3=18972
- interference, transmitted-light 3=16752
- micrometer screw calibration, interferometric 3=21524
- photoelectric scanning 3=16753
- polarizing, mag. domains obs. 3=24010
- stage, cooled thermoelectrically 3=14327
- ultrasonic phase contrast. 3=222
- u.v., constant deviation, illuminator 3=245

Microscopy

See also Electron microscopy.

- crystal orientation mounting attachment 3=20775
- ear, inner, sensory hairs study 3=3657
- expanding applications, review 3=1803
- ferromagnetic domain structure 3=20589
- fibres, profile measurement 3=11647
- high resolution, diffrn. images of circular objects 3=9618
- high temp. (up to 1800°C) 3=23524
- hot-stage, thermal analysis 3=18683
- illumination, oblique, significance 3=24011
- interference, surface topography meas. 3=14324
- interference system, simple 3=3887
- low-resolution, diffrn. images, meas. 3=9617
- luminescence 3=24012
- metallographic etched microstructure obs. by Ar ion bombardment 3=20976
- metallurgical, apparatus development 3=246
- observation of transparent isotropic objects 3=3872
- phase contrast, vector theory, diffr. restrictions 3=19018

Microscopy — contd

- phase objects, with partially coherent light 3=14317
- phase objects, using double microscope 3=21525
- replication, non-destructive, by Ni electrolytically deposited layer 3=25798
- size meas., visual factors 3=23719
- slide, reversible, made of Duralumin 3=16755
- ultraviolet transmission, metals 3=23523
- X-ray, Au films, rel. to electron microscopy 3=6903
- X-ray, metal film examination 3=6902
- X-ray, moiré fringes of gratings and fibres 3=13578
- Zernicke effect 3=11932
- Cu, dislocations, etching reagents for obs. 3=8438

Microwave spectra

See Spectra, radiofrequency.

Microwave spectrometers

See Spectrometers, radiofrequency.

Milky Way

See Galaxies.

Mineralogy

See Minerals.

Minerals

- albite, NaAlSi₃O₈, melting curves rel. to pressure 3=9657
- andalusite, e.s.r. Fe³⁺ ion isomorphism 3=20855
- anhydrite (CaSO₄), crystal structure redetermination 3=25717
- anorthite, phase transformations, 25° - 350°C 3=16019
- aragonite, CO₃ ion bending vibration 3=25189
- australites, Th and U content by α-counting 3=7025
- basalts, from Victoria (Australia), magnetization stability 3=1495
- beryl, elastic waves in half-space. 3=194
- beryl, optical props. and vibr. frequ. 3=10905
- beryllonite, NaBePO₄, crystal structure 3=13472
- beryls, Fe-coloured, absorption spectrum, 290° to 1.7°K 3=3001
- bosalt in EM7, Mohole project, magnetic props. 3=9137
- chlorite, crystal structure, correction 3=8860
- chlorites, theory of polymorphism 3=23370
- chlorophacite, mag. props., effect of heating 3=1499
- in chondrites, phase composition 3=9186
- chromite-olivine system, Fe Kα X-ray intensity rel. to Fe content 3=3421
- cronstedtite, polymorphism 3=8854
- cubanite, polymorphic transition and mag. props. 3=11049
- clay, X-ray phase analysis 3=13480
- detection, by e.m. wave absorption, diffraction effects 3=18489
- diopside, CaMgSi₂O₆, melting curves rel. to pressure 3=9657
- fluorite, colour centres and radioactivity 3=8458
- fluorite, dynamics of structure, i.r. props. 3=10939-40
- fluorite, natural and synthetic, luminescence 3=15703
- fluorspar, luminescence 3=8616
- franklinite, magnon dispersion, by neutron scatt. 3=3127
- γ-testing, effect of nonuniform distrib. 3=2397
- gypsum hemihydrate, mechanical strength and induction period of structure formation 3=8790
- haematite-ilmenite solid solns., magnetization 3=3523
- hedleyite, structure and synthesis 3=3343
- heulandite, dielec. dispersion, freqs. < 500 c/s 3=8551
- "hydrobiotites", crystal layer sequences 3=20858
- hydrosodalite, unit cell and space group 3=23461
- ilmenite-hematite solid solutions, synthetic, mag. self reversal 3=18576
- ilmenite-haematite system, low temp., superparamagnetism 3=8655
- kainosite, unit cell and space group 3=13473
- kaolinite-type, double layer, polymorphism 3=13447
- limestones, Tandur, Young and torsion moduli by u.s. 3=15973
- lomonosovite-murmanite group, crystal structure, atomic, chemical compositions, transition reactions 3=18325
- magnetite, mag. transformation and domain structure 3=9138
- mica, etching of cleavages 3=807
- moonstone, crystal unmixing, electron microscope obs. 3=20975
- muscovite, absorption spectrum rel. to added KBr 3=10958
- ore inclusions study by field establishment 3=2083

Minerals — contd

- orthoclase, i.r. reflection spectrum 3=18014
 perovskite ferroelectrics, acoustic and X-ray excitation of anomalous layers 3=22993
 perovskite-type (ABO_3) ferroelectrics electric field gradient 3=22992
 pleochroism; colour change meas. rel. to orientation 3=922
 prochlorite (natural silicate), use in X-ray spectrometers and monochromators 3=4230
 pseudomalachite, crystal structure 3=3307
 pyrrhotite, anisotropy; const., below 205°K 3=15770
 rock densities, in situ in Mohole, and gravity, vert. gradient 3=16187
 rocks, elastic wave atten. processes 3=14234
 rocks, elastic waves absorption meas. 3=3-29
 rocks, elastic waves, attenuation const. 3=3428
 rutile, bulk-cond. 3=10842
 rutile diodes, tunnel field emission 3=9846
 rutile, pulse currents of 100 μ sec, ohmic cond. 3=13108
 salesite, $CuO_3(OH)$, crystal structure 3=1338
 siderite ($FeCO_3$), Néel point 3=15749
 spinels, cation distrib. and i.r. spectrum 3=13184
 spodumene, crystallization, from Raman spectra 3=5086
 stishovite, equation of state 3=17666
 stishovite (SiO_2), crystal structure 3=5108
 tektites, cosmic-ray exposure history, rel. to origin 3=1515
 tektites, origin by O isotope studies 3=9014
 thermal analysis, comprehensive, apparatus 3=8988
 ultra-thin slices, electron microscopy 3=23533
 uranium minerals, space group det. 3=11271
 vaterite ($CaCO_3$), lattice const., from X-ray and optical data 3=25727
 vlasovite, crystal structure 3=13474
 wehrlite, structure and synthesis 3=3343
 wüstite, O/Fe ratio rel. to oxygen press. 3=5076
 zeolite, n.m.r. of water, calc. 3=11126
 zeolite oil vapour trap 3=14226
 zeolites, microwave and dipolar spectra 3=22984
 zeolitic, water, spin-lattice relaxation time 3=21415
 zinc blende, using free-electron network model 12939

Mirages

See Atmospheric optics.

Mirrors

See also Telescopes, astronomical.

- aluminized, reflectance rel. to MgF_2 and SiO coatings 3=11929
 astronomical, large, practical surface accuracy 3=1501
 "bent axis" focusing 3=24006
 contrast transfer, parameters eval. 3=14510
 dielectric multilayer coatings 3=11930
 films, protective, evaporated CeO_2 and SiO 3=11927
 for masers, optical, ruby 3=9978
 masers, optical, mirrors, dielectric, scattering, light 3=16805
 metal-dielectric, semitransparent, u.v. 3=9576
 metallic-dielectric, for Fabry-Perot interferometer 3=3889
 multilayer, for 2350-20 000 Å, dielec. 3=24050
 paraboloidal, null correcting system 3=7305
 quartz, fused, prod. and testing 3=16748
 Al SiO coated, effect of u.v. irradiation on far u.v. reflectance 3=19004
 Se, for i.r. polarization, prep. 3=24060

Moisture

See also Atmosphere, humidity; Humidity; Permeability, mechanical.

- atmosphere, above desert, Sahara, total 3=18493-4
 gas, meas., when in two phases 3=7252
 meas. by neutron probe 3=7076
 measurement devices 3=1573-4
 moist medium, freezing 3=1868

Molecular beams

See also Particle velocity, analysis.

- charge exchange with ion beam 3=24223
 conc. and first inverse moment of speed distrib. in effusion 3=10553
 crossed, interactions, meas. appar. 3=4788
 detection, by electron ionization 3=4789
 detection, modulation method 3=25155

Molecular beams — contd

- detector, using electron bombardment ioniz. 3=6440
 directivity, beam formed by channel gas flow 3=2679
 directivity patterns formation from long channels 3=25156
 electron scatt., low energy 3=15397
 frequency standard, choice of molecule 3=12882
 high intensity apparatus, supersonic stream gas source 3=8316
 for measuring moments, rot., mag. 3=19974
 metastable state prod., by electron bombardment 3=4742
 methane and deuterioforms, mass spectra, metastable transitions 3=25148
 mixed energy state emission from two-cavity generator 3=6442
 operational efficiency measurement 3=12884
 radiation, resonance, spectroscopy 3=6443
 rarefied gas dynamics, conference 3=11813
 scattering cross-sections, approximation formulae 3=17619
 scattering data interpretation, validity of WKB approx. 3=8317-18
 scattering, high-velocity cross-sections 3=8315
 selector, mechanical, analytical calc. 3=15398
 velocity analyser for evaporating subst. 3=15399
 velocity selector 3=12883
 wide-angle scattering, rainbow effect 3=6439
 Ar scattering on LiF cleavage plane 3=2680
 BaO, interaction with W incandescent surface 3=23541
 BaO, microwave spectrum by electric resonance technique 3=17570
 CO_2 , intense, production using nozzle 3=4790
 H_2 , clustered, prodn. 3=2678
 He, clustered, prodn. 3=2678
 He scattering on LiF cleavage plane 3=2680
 Hg, intense jet prodn. 3=20034
 K, reaction with HBr in crossed beams 3=6914
 K, scattering with Kr and HBr, rainbow effect 3=6439
 N_2 , clustered, prodn. 3=2678
 N_2 , high intensity apparatus 3=8316
 NH_3 , directivity on flowing into vacuum 3=22615
 NH_3 , radiation in compound energy state 3=6443

Molecular relaxation

See Molecules, relaxation.

Molecular weight

- atmosphere, 100-210 km, mass spectr. meas. 3=3481
 Bi vapour 3=9662
 plasma, air 3=21818
 polymers, irradi., mol. wt. distrib. 3=8325
 polymers subjected to density-gradient centrifugation 3=8323
 polymethylmethacrylate, dilute solns. 3=134
 vinyl polymers, irradiated 3=17626

Molecular weight determination

- colloidal electrolytes, from sedimentation and diffusion data 3=6938-41
 with mag. supported ultracentrifuge 3=8942
 polymers, amorphous, by electron microscope 3=20039
 from solution turbidity, correction 3=23882
 ultracentrifuge cell, sedimentation obs. 3=8979

Molecules

See also Kinetic theory; Spectra

- aromatic, e.s.r., hyperfine coupling const. 3=17552
 assemblies, small-angle critical scatt. 3=52
 collisions with atoms, resonance, semiclassical, approx. 3=22612
 complexes with odd ligand states 3=15333
 dielectric interactions, bibliography 3=13102
 e.s.r. powder line shape 3=17612
 furan, molecular structure 3=21354
 hydrogen, quantum effects in liquid state 3=21319
 i.r. spectroscopy, use in structure determ. 3=15316
 ion-molecule reactions, H transfer, cross-sections, energy depend. 3=23540
 ionization, in MeV range 3=20024
 ionization potential meas. for 300 mols. 3=7430
 long chain, reaction kinetics 3=25817
 luminescence, use in biological research 3=13942
 luminescence, polarization meas., photoselection method 3=15370
 magnetic dipoles, neutral, containment, toroidal 3=15271
 magneto-optical rotation in diamag. mole., theory 3=6383

Molecules — contd

- methanamide, thermal neutron scatt. 3=2652
 neutron scatt., appl. of classical self-correl.
 function 3=4732
 nitro group, mag. anisotropy study 3=12856
 n.m.r. spectra calc., "direct" method 3=15381
 ortho-para conversion, n.m.r. study 3=15379
 polarization, orientation, of multi-component
 systems 3=15394-5-6
 polyatomic, thermodynamic functions, centrifugal
 distortion corrections 3=22522
 pyridine, molecular structure 3=21354
 quantum chemistry, semi- and non-empirical
 theories 3=12745
 quinoline, molecular structure 3=21354
 randomly oriented in triplet state, e.s.r. line shape 3=25135
 scattering, light, polar, meas. possibility 3=24059
 spectra in condensed medium, effect of effective
 field 3=19958
 spin coupling, Heitler-London method 3=6385
 styrene, molecular structure 3=21354
 symmetry groups of non-rigid molecules 3=22518
 thiophene, molecular structure 3=21354
 III-V compounds, effective charge, and atomic
 polarizabilities 3=17637
 transition metal complexes, optical rotation 3=8271
 in transport process systematization 3=5392
 Co(ethylenediamine)₃³⁺ ion, optical rotatory
 dispersion 3=730
 D₂, elec. charge, upper limits 3=10091
 H₂, elec. charge, upper limits 3=10091
 H₂, isotopic, reaction with isotopic H₂⁺ 3=2677
 HF, diamagnetic suscept. calc. 3=8258
 H₂S, neutron scatt., total cross-section 3=4733
 N₂, diamag. suscept. calc. 3=8259
 N₂, formation and pink afterglow-excitation 3=22486
 NH₃, X-ray and electron diffraction 3=8220
 N₂-N₂ ionization collisions meas. 3=4015
 O₂, electron attachment coeff. at low energy 3=362
 O₂-O₂ ionization collisions meas. 3=4015
 T₂, ortho-para conversion by absorption 3=12789

configuration and dimensions

- See also Chemical structure; Crystal structure, atomic.
 asymmetry, n.m.r. splittings 3=2660
 chain, spatial location of atoms 3=12885
 diatomic molecules, internuclear distance from
 vibrational bands 3=10501
 effects of anharmonic vibrations 3=15328
 free molecules, from electron diffraction patterns 3=12790
 hydrides, rel. to atomic valence state energies 3=721
 inclusion compounds, review 3=1250
 internuclear distances 3=8228
 n.m.r. application 3=15376
 Raman spectroscopy, appl. 3=5517
 structure det. from moments of inertia 3=2596
 structure det. from moments of inertia 3=2597
 symmetry groups identification 3=22535
 Na₂X₂O₇, anion structure 3=4974
 XeF₂, 3=16074
 XeF₄, 3=16075
configuration and dimensions, inorganic
 AlAu, internuclear distance 3=10505
 As(CN)₃, chain structure 3=8849
 B hydrides, bond lengths 3=22556
 Ba(OH)₂.8H₂O, OH bond orientation 3=4968
 B₂O₃, 3=8272
 B₂O₃, apex angle 3=10527
 C₆₀, x¹E_g² and b¹A_{1g} states 3=8251
 CBr radical, bond length 3=25092
 CdI₂, amine complex 3=15358
 cis-N₂F₂, 3=25111
 CO₂, structure det. from moments of inertia 3=2597
 CS₂, structure det. from moments of inertia 3=2597
 CoCl₂.6H₂O; water mol. orientations by n.m.r. 3=1201
 difluoramine 3=8274
 Gd³⁺ perchlorate solutions, hydration, from n.m.r. 3=18832
 H₂, binding energy, relativistic corrections 3=4746
 HCN, structure det. from moments of inertia 3=2597
 H₂O, structure det. from moments of inertia 3=2597
 HF, equil. internuclear dist., one-centre calc. 3=22564
 H₂O, equil. internuclear dist., one-centre calc. 3=22564

Molecules — contd**configuration and dimensions, inorganic — contd**

- H₂S₂, dihedral angle 3=6401
 K₂HgI₄, K₂HgI₄.H₂O, powder, by spectra, diffuse reflect-
 ance, u.v. 3=23557
 Li^{6,7}H 3=4752
 LiOH.H₂O, OH bond orientation 3=4968
 NH₃, equil. internuclear dist., one-centre calc. 3=22564
 NO₂, structure det. from moments of inertia 3=2597
 NSF 3=22563
 O₃, structure det. from moments of inertia 3=2597
 OF₂, 3=8278
 P₄, 3=5050
 SF₆, electron diffr. meas. 3=25113
 SF₆, electron diffr. meas. 3=25113
 S₂N₄, 3=25712
 SO₂, structure det. from moments of inertia 3=2597
 SeF₆, electron diffr. meas. 3=25113
 SeF₆, electron diffr. meas. 3=25113
 SO₂.Li₂.H₂O, OH bond orientation 3=4968
 Sr(OH)₂.8H₂O, OH bond orientation 3=4968
 XeF₂, XeF₄, calc. 3=15355
 XeF₄, 3=12844
 ZnCl₂, amine complex 3=15358

configuration and dimensions, organic

- asymmetry 3=20003
 benzene, multi-centre pi-electron integrals 3=12847
 carbonyl fluoride 3=6410
 cathrate hydrates, tri n-butyl sulphonium fluoride
 hydrate 3=3309
 charge-transfer complexes, rel. to electronic
 props. 3=15364
 chlorodifluoromethane 3=6411
 cis-, gem-, and trans-dideuteroethylenes, vapour
 pressures 3=8247
 clathrate hydrates, tetra n-butyl ammonium benzoate
 hydrate 3=3308
 cyanamide, HDNCN and D₃NCN, model from
 spectra 3=10532
 dibenzenechromium, bond alteration rel. to "pseudo Jahn-
 Teller effect" 3=729
 difluoroethylenes 3=17595
 2,2'-dimethyldiphenyl ether; methyl and ring protons
 spin-spin interaction 3=2645
 dimethyl ether 3=17596
 ethane 3=4766
 ethane-d₈, from Raman spectrum 3=4765
 ethyl bromide 3=17597
 formaldehyde, r. structures 3=25123
 formaldehyde, 3=17598
 formamide, calc. 3=2648
 indophenol, asymmetry 3=20003
 ketene 3=17600
 methane, internuclear dist. 3=22586
 monodeuteroethylene, vapour pressure, isotope
 effect 3=8248
 polydimethyl-diphenyl and polydimethyl siloxanes,
 cross-linking 3=10563
 quinonemethide, asymmetry 3=20003
 silyl acetylene, from microwave spectrum 3=25132
 stilbenequinone, asymmetry 3=20003
 tertiary butyl chloride 3=12849
 vinylidene fluoride 3=17595
 C-C, C-O, C-N spacings in free mols. 3=6387
 CH₄, structure det. from moments of inertia 3=2597
 C₂H₂, structure det. from moments of inertia 3=2597
 C₂O₄H₂.2H₂O, OH bond orientation 3=4968
 C₆O₆H₆, OH bond orientation 3=4968
 C₆H₆.O₆.H₂O, OH bond orientation 3=4968
 C₁₂H₂₂O₁₁, OH bond orientation 3=4968
 HNCN, free radicals, geom. structure 3=8307
 K vanadyl oxalate, e.s.r. study 3=1189
configuration and dimensions, macromolecules
 No entries this year
dissociation
 See also Heat of dissociation.
 acetylene flame, outer cone processes 3=23542
 atomic recomb., 3-body collisions 3=8424
 cyclohexane, excited, ring cleavages 3=25149
 diatomic, by third body 3=12869
 diatomic gaseous, effect of anharmonicities 3=2667

Molecules — contd**dissociation — contd**

- diatomic, homonuclear, rel. to vaporization of solid 3=740
 diatomic, impulsive collision model 3=20027
 diatomic, linear chain model, rel. to electronic coupling 3=2664
 diatomic, mean first-passage times 3=8304
 diatomic molecules, vibrational relaxation 3=15388
 diatomic, statistical one-dim. model 3=6422
 diatomic, statistical study 3=6423
 DNA degradation by noncavitating ultrasound 3=20036
 electron capture, cross-section calc. 3=4785
 ethanol 3=12870
 evaporation, and viscous flow mechanisms 3=21320
 gas hydrates 3=17618
 ions and radicals, rel. to polariz. and radical deformation energy 3=8303
 ions, by elec. and mag. fields only 3=14516
 linear chains, influence of electronic coupling, erratum 3=8305
 metal halides, in flames with active N, and metal spectra 3=22605
 metastable ion transitions, using 180° mass spectrometer 3=2665
 methane and deuterioforms, mass spectra, metastable transitions 3=25148
 n-butane, excited, elementary processes 3=12873
 n-paraffins, fragmentation model 3=16903
 phenoxy radical in nitrogen matrix, photolysis, 4.2°K 3=3403
 photodiss., inverse population of levels, negative absorpt. coeffs. 3=4787
 predissociation, theory 3=25146
 recombination, third-order, theory 3=6425
 rotating anharmonic diatomic mols., unimol. rate theory 3=6907
 behind shock wave, dissociation and recombination 3=11857
 t-butoxy radical, rel. to pressure 3=3385
 from vibrational levels, chemical relaxation 3=22604
 vibrational relaxation, moment eqns. 3=8306
 vibrationally excited, unimol. reaction theory 3=3386
 AlAu 3=10505
 B₂, dissoci. energy 3=305
 BiBr, atomic products, from emission spectrum 3=6389
 Br₂ 3=13594
 Br₂, recombination mech. 3=6427
 CBr radical, ground state energy 3=25092
 C₂H₂ ions 3=10549
 Cl₂, in shock waves 3=25147
 CO, by electron impact, O⁺ prod. 3=361
 CO, dissociative ionization by ion impact 3=21709
 CO₂, by electron impact, O⁺ prod. 3=361
 CO, shock tube study 3=15389
 D₂⁺, in collision with D₂ 3=15391
 D₂⁺ ions by strong elec. fields 3=7436
 H⁺, H₂⁺ and H₃⁺ incident on H₂ 3=15390
 H₂, by Ar, statistical study 3=6423
 H₂, electron capture, cross-section calc. 3=4785
 H₂, proton impact, giving Balmer emissions 3=15278
 H₂, recomb. kinetics at 1072°K 3=6426
 H₂⁺ ion beams, passing through different gases 3=7445
 H₂⁺ ions, by strong elec. flds. 3=7436
 H₂⁺, isotopic forms, by elec. and mag. fields only 3=14516
 H₂⁺ ions by strong elec. fields 3=7436
 HD⁺ ions by strong elec. fields 3=7436
 HNO₂ ↔ NO + NO₂ + H₂O, vapour-phase equilibrium 3=25813
 I₂, by Ar, statistical study 3=6423
 I₂, recomb. in NO, rel. to concn. and pressure 3=2668
 I₂, recomb. by rare gas, kinetics 3=6424
 I₂, recombination mech. 3=6427
 N₂, charge transfer from He⁺ 3=24224
 NH₃, shock-heated, kinetics 3=20026
 NO⁺ formation, in ion-molecule reactions 3=23539
 NO, meas. 3=7274
 NO, electronically excited 3=12872
 N₂O₄, gas phase, equilibrium const. 3=2666
 N₂O₄, rate meas. by u.s. absorption 3=4784
 O₂, by Ar, statistical study 3=6423
 O₂, by electron impact, O⁺ prod. 3=361

Molecules — contd**dissociation — contd**

- O₂, charge transfer from He⁺ 3=24224
 O₃ dil. soln. in liquid N₂, photolysis in u.v. 3=3408
 O₂, from vib. levels, chemical relaxation 3=22604
 O₂, rate meas. in shock wave 3=7274
 PCl₃, thermal conductivity of dissociating system 3=9503
 SO radical, from absorpt. spectrum 3=2625

dissociation energies

- calculation, diatomic, from H—F functions 3=20025
 determination by ion impact 3=21709
 ethyl iodide 3=20978
 metal sulphides, from mass spectrometry 3=25806
 rel. to molecular constants 3=12871
 CaF 3=21638
 CsHg 3=2586
 H₂ 3=25095
 HfO₂ 3=7390
 InO 3=12010
 KHg 3=2586
 PO, X, B and C' states 3=17582
 SeO 3=25105
 Si₂, dissociation energy 3=8268
 XeO, dissoci. energy 3=15341
 XeN, dissoci. energy 3=15341

electronic structure

See also Bonds.

- AB₂ mols., MO-LCAO approx., Walsh rules 3=22519
 alternant MO approximation, correlation effects 3=19966
 anharmonic corrections in triatomic molecules with Renner effect 3=12800
 anthrals, electronic spectra and H bonding 3=8287
 aromatic, e.s.r., hyperfine coupling consts. 3=17552
 aromatic free radicals, g factors theory 3=20029
 aromatics with orbitally degenerate ground states 3=12845
 atomic orbital configuration wavefunctions for small molecules 3=12806
 benzene, refined AMO treatment of ground state 3=12848
 benzene, spin-spin interaction, correction 3=8290
 benzene, triplet state 3=16630
 benzene, vibronic-spin-orbit perturbations and assignment of lowest triplet state 3=8289
 benzonitrile, by microwave spectra 3=2640
 bis (2,2' biphenylene) methane, from e.s.r. 3=15362
 bipyridyl radical, biquaternary, spin densities 3=2654
 bond and orbital electronegativities 3=12807
 bond orders calc., Hall's method 3=10496
 bond order matrix in conjugated systems 3=8237
 boron hydrides, LCAO-MO calc. 3=6396
 butadiene, π-electrons, valence bond theory 3=6375
 carbonyl anion radicals 3=6429
 charge-transfer complexes, rel. to electronic props. 3=15364
 conformational stability, for degenerate states 3=19955
 conformational stability, for nondegenerate states 3=19956
 conjugated fluorine cpds., theory of n.m.r. chemical shifts 3=8299
 correl., pairs, biorbital function approach 3=25088
 cyclic systems, LCAO calc., new method 3=2601
 cycloheptatriene cycloheptatrienyl radical, by e.s.r. 3=4778
 cyclo-octatetraene complex with Fe tricarbonyl 3=2643
 cyclopropanes, chlorinated, from n.q.r. 3=25142
 diamagnetic polarization, molecular orbital theory 3=10495
 diatomic, electronic energies, automatic computation 3=19970
 diatomic homonuclear mols., electron densities, forces 3=25079
 diatomic, linear chain model, rel. to dissociation 3=2664
 diatomic molecules, electron-vibrational bands, relative intensities 3=22534
 diatomic, multi-configurations calc. 3=15318
 diatomic, potential-energy function 3=22538
 diatomic, potl. energy function 3=12812
 diatomic, probabilities of transitions 3=15335
 diatomic, semi-empirical valence bond theory 3=12805
 diatomic, spectral absorpt. coeffs. calc. 3=2606
 diatomic, spin-spin and spin-orbit interactions, similarity 3=722
 dihedral, electronically degenerate, rotational levels 3=718

Molecules — contd

electronic structure — contd

- diphenyldiazomethane, by e.s.r. 3=4775
- dipole moments in ground and first excited states 3=2605
- divinylamine, improved LCAO method 3=4774
- electron correl. problem 3=12743
- electrostatic calc., two and three-centre integrals 3=6374
- energy level eigenvalues, lower bounds 3=25084
- ethanes, geminal HH coupling constants 3=8294
- excitation transfer and relaxation in solid media 3=10619
- ferrocene, bonding, magnetic anisotropy meas. 3=8639
- fundamental molecular consts., general relation between two electronic states 3=10499
- furan, semiempirical SCF-LCAO-MO treatment 3=17599
- Gaussian functions in wavefunction calc. for small molecules 3=19964
- Gaussian functions in wavefunction calc. for small molecules 3=19965
- g-tensor, gauge-invariant theory 3=6384
- halogens, electron affinities and charge transfer frequency 3=8257
- Hartree-Fock approx., perturb. method 3=3754
- Hartree-Fock calc., errors 3=8169
- Hartree-Fock functions with limited basis 3=8239
- heteroatom radicals, SCF calc. of spin-density distrib. 3=10530
- hexahalide complexes, 4d and 5d, charge-transfer states 3=19972
- hydrides, shapes rel. to atomic valence-state energies 3=721
- hydrocarbon, conjugated, π orbital, doubly occupied, correl. energy 3=22576
- hydroxy-benzenes, π -electron distrib. 3=4781
- Jahn-Teller effect, dynamical 3=22527
- by low-energy electron impact spectroscopy 3=4740
- magnetic susceptibility of diatomic molecules 3=10494
- many-electron theory, effect of correlation on orbitals 3=12744
- methane, one-centre wave functions 3=17577
- methanes, geminal HH coupling constants 3=8294
- methyl alcohol, σ -Stark effect of rotational transitions 3=734
- methylene derivs., effect of bond angle on spin-spin interact. 3=25126
- methylene, spin-spin interaction 3=17602
- methylene derivatives, spin-spin interaction 3=10535
- mono-olefins, analogue of $n \rightarrow \pi^*$ transitions 3=15367
- N-heteroaromatic, $n \rightarrow \pi^*$ transitions, exciton and MO calc. 3=12804
- N-heterocyclic, spin-spin interactions 3=19969
- naphthalene 3=21354
- naphthalene, in durene, radiationless triplet-singlet transitions 3=23115
- nitrile anion, spin-density distrib. 3=6428
- nitrogen heterocyclics, spin-orbit coupling and radiationless processes 3=17604
- n.m.r. application 3=15376
- octacyanide complexes 3=725
- one-centre integrals, computer programmes 3=8225
- orbital theories; Hartree-Fock Hamiltonian potential of subgroup 3=2600
- organic cpds. containing π -electrons, H bonds, effect on n.m.r. 3=15383
- para-halogeno-styrene 3=1368
- paramagnetic, spin polarization effects 3=22568
- para-substituted fluorobenzenes, π -electron distrib. and F^{19} n.m.r. shielding 3=8300
- pentacyclic hydrocarbons, ring currents 3=10536
- perturbed Hartree-Fock calc. 3=8260
- phthalimide derivs., first and second excited states 3=4739
- π -electron calculations, present status 3=12813
- polarizabilities of aliphatic C-C and C-H bonds 3=2636
- polyacenes, open-shell SCF triplet state energies 3=25128
- polyatomic O-containing mols., C_{2v} symm., np type orbitals 3=15321
- polyatomic, transitions, mag. dipole allowed 3=728
- polymers, vibrational effects in exciton motion 3=10561
- polynucleotides 3=2682
- protein, energy band structure calc. 3=12886

Molecules — contd

electronic structure — contd

- pyrazine, ground-triplet mixing and transitions 3=22588
- pyridine, ground-triplet mixing and transitions 3=22588
- pyrrole, improved LCAO method 3=4774
- quantum-mechanical theories, review 3=22533
- quantum theory, polycentric integrals eval. 3=8221
- rotational determination, effect of vibr. 3=2596
- rotor mol. of orthorhombic symm., fourth-order Hamiltonian 3=25083
- self-consistent-field theory, general treatment 3=17563
- semiempirical one-centre Coulomb repulsion integrals 3=17560
- semi-united atom concept, validity 3=8223
- seven electron pair coordination 3=25075
- simple molecules, direct soln. of Schrödinger's eqn. 3=12814
- single-triplet transitions, role of ground state 3=8245
- and spectra i.r., band intensity, multiatomic 3=25076
- spin-spin coupling across several bonds 3=719
- spin-spin coupling Hamiltonian in multiplets 3=19968
- spin densities in 3-electron binding system 3=12791
- split p-orbital, Dewar's method, evaluation 3=17561
- stability in Thomas-Fermi theory 3=8246
- substituted aromatic ions, spin resonance, perturbation model 3=12860
- symmetry groups of non-rigid molecules 3=22518
- symmetry species of excited states 3=22531
- tetracyclic hydrocarbons and their alkyl-substituted derivatives 3=15360
- Thomas-Fermi interaction potential, boundary effects 3=17562
- 3d group central ions, optical electromag. 3=8222
- three-body, simple analytic approx. 3=10484
- two-centre integrals, calc. schemes 3=22532
- two-centre one-electron integrals 3=12792
- transition-metal free complexes 3=15331
- transitions, non-adiabatic on intersection of terms of identical symmetry. 3=741
- unsaturated hydrocarbons, d-hybridization in π molecular orbitals 3=10533
- united-atom expansions, use of 3=12810-11
- valence-bond structures and matrix elements for any multiplicity 3=6382
- valence bond wave-functions, population analysis 3=63757
- vibrational transition probabs, calc. 3=12803
- vinylamine, improved LCAO method 3=4774
- zero-field splittings in molecular multiplets 3=10535
- AlF singlet electronic states 3=25090
- As₄S₄, "electron-on-sphere" model 3=727
- BeO, ($B^2\Sigma^+ - X^2\Sigma^+$) system, transition probabs. 3=8249
- B₂H₄, valence structure 3=19990
- bis(p-nitrophenyl) anions, electron transfer, e.s.r. h.f.s. 3=22597
- BrF₃ 3=2631
- C¹³ chem. shifts in conjugated molecules, MO theory 3=17557
- C₂, C₃, C₄, density distrib. 3=22540
- C-C spin-coupling consts. 3=10498
- CH and CD, electronic energies, vib. consts. 3=25119
- CH₄, Hartree-Fock approx. 3=10534
- CH₄, BH₄⁻, NH₄⁺, isoelectric, one-centre self-consistent field wave functions 3=22554
- C₂H₂ rel. to isoelectronic N₂ 3=12837
- C₂H₂, by electron bombardment of molec. beams 3=4742
- C₂H₄, by electron bombardment of molec. beams 3=4742
- CO, electric field gradient at O nucleus, calc. 3=19977
- CO₂, ground state, extended basis-set LCSTO-MO-SCF calc. 3=10528
- CO₂ radical, trapped 3=6418
- Cu(II) complexes, ligand field approx. 3=22560
- d-electron systems, weak-field coupling 3=22526
- [Cu(CN)₄]²⁻ ions calc. 3=19992
- H₂, binding energy, relativistic corrections 3=4746
- H₂, correlation diagram, oscillator strengths 3=17574
- H₂, correlation splitting 3=2616
- H₂, ground state, expansion of exact wave-functions 3=63757
- H₂, ground state, MO calc. 3=19980
- H₂, ground state, "open-shell" type wave function 3=25095
- H₂, ions, induction energies, spherical term 3=17568

Molecules — contd

electronic structure — contd

- H, ion, one-centre wave-function 3=8255
 H_2 , metastable $^3\Pi_u$ state, h.f.s. 3=4745
 H_2 , MO's based on central potentials, average Hamiltonian and correlation energy 3=17573
 H_2 , one-centre wave functions 3=17577
 H_2 , one-electron potential function 3=17575
 H_2 , perturbation theory 3=15336
 H_2 , valence bond wave-functions 3=6375
 H_2 , vibrational anal. of Heitler—London potential 3=19981
 H_2 and H_2^+ , wave functions calc. 3=19982
 H_2^+ exact wave-function, on one-centre hydrogenic basis, resolution 3=25094
 H_2^+ , variational approximations 3=7126
HF, constrained wave-functions 3=8256
HF, force consts. and internuc. distances, one-centre calc. 3=22564
 $(H_2O)_4$ cubic complex in water 3=23868
 H_2O , electron density distribution 3=12843
 H_2O , force consts. and internuc. distances, one-centre calc. 3=22564
 H_2O , $1s\sigma$ state, molecular orbital calc. 3=22561
He—He Rosen interaction potential 3=10507
 HeH^+ , ground state 3=12821
 I_2 , radiative lifetime of fluorescence, $B^3\Pi_{u,g} \rightarrow X^1\Sigma_g^+$ 3=11838
 I_2 , ($B^3\Pi_{u,g} \rightarrow X^1\Sigma_g^+$) band, Franck—Condon factor surface 3=12823
 IF_5 3=2631
 Li_2 , ground and excited states, LCAO computation 3=25098
 LiH , Hartree—Fock SCF calc. 3=25099
 LiH , magnetic susceptibility and shielding calc. 3=8260
 LiH , orbital theory 3=2600
 LiH , valence bond wave-functions 3=6375
 $M(XY)_6$, G matrix elements 3=4741
 $Mo_6Cl_8^{4+}$, bonding 3=8281
 N_2 , Franck—Condon factors and transition moments 3=2621
 N_2 , weak band systems 3=22545
 N_2 , transition moment rel. to internuc. distance 3=2620
 N_2 , from absorpt. spectrum 3=4754
 N_2 , electron density, X-ray scatt. 3=19985
 N_2^+ , SCF wave-functions 3=25110
 NH_2 radical, spin polarization effects 3=22568
 NH_3 3=2632
 NH_3 , bond-orbital and electron-pair function 3=22565
 NH_3 , electron-density distributions 3=17587
 NH_3 , force consts. and internuc. distances, one-centre calc. 3=22564
 NH_3 , use of Gaussian functions in wavefunction calc. 3=19965
 NH_3 , quantum-mech. theory, semiempirical 3=25112
 NH^+ radical, h.f.s., mol. orbital calc. 3=15343
 NH_4^+ , Hartree—Fock approx. 3=10534
 $NH(SO_3^-)$ in γ -irrad. K sulphamate 3=6417
 $(NH_4)_2HPO_4$, irrad., π -electron radical 3=11117
NO 3=10517
NO, energy transfer in fluorescence 3=8265
 NO_2 , electronic levels rel. to thermal emission 3=726
 NO_2 3=13598
 NO_2^- , oscillator strengths 3=1689
 NO_2 radical, trapped 3=6418
NO, Rydberg states of 1st ionization limit 3=19986
 NO_2^+ , SCF wave-functions 3=25110
 NO_2 , upper level, oscillator strength 3=19994
Na—aromatic complex, odd electron density on Na 3=25138
 Na_2 , from spectrum, u.v. 3=22549
 $NdCd_{11}$ 3=13237
 O_2 , by electron bombardment of molec. beams 3=4742
 O_2 , electronic transition moment for Schumann—Range bands 3=724
 O_2 , Hopfield's emission bands 3=8267
 O_2 , O_2^+ , O_3^{3+} , config. interaction calc. 3=22571
OH, transitions, Franck—Condon factors, calc. 3=12827
 $O^{17,18}H$, dipole moments, h.f.s. 3=12828
 PH_3 , quantum-mech. theory, semiempirical 3=25112
S cpds., outer shell, data from K α transitions 3=19997

Molecules — contd

electronic structure — contd

- S halides 3=4759
 SF_6Br 3=22572
 S_4N_4 , "electron-on-sphere" model 3=727
 SeO , $A^3\Sigma^- \rightarrow X^3\Sigma^-$ system, rotal. analysis 3=25105
 SeO , $^3\Sigma^- \rightarrow ^3\Sigma^-$ system, rotal. analysis 3=4758
 $Ta_2Cl_{12}^{2+}$, bonding 3=8281
Te halides 3=4759
TiO Franck—Condon factor, r-centroid for α -system 3=22551
UCd₁₁, electronic configuration and valency 3=13237
Va—O compounds, from spectrum, i.r. absorpt. 3=22574
VO, Franck—Condon factor, r-centroid for $^2\Delta \rightarrow ^2\Delta$ system 3=22551
 XeF_2 3=15356
 XeF_4 3=15356
 XeN 3=15341
 $Xe^{129}F_2$, $Xe^{129}F_4$, $Na_2Xe^{129}O_6 \cdot H_2O$, hydroquinine clathrate, from Mössbauer effect, 4.2°K 3=17634
excitation
acetone, flash photolysis. 3=25835
alkali hydride, potential-energy curves of excited states 3=12815
aromatic, triplet state deactivation, rel. to phosphorescence 3=11799
atmosphere, vibr. excitation, effects 3=13786
n-butane, electron impact, dissociation 3=12873
butane, unimolecular reactions of excited molecules 3=4786
collision, vibr. rot. excitation, diatomic molecules 3=8314
collisions, relax. expts. rel. to transition probab. 3=6379
cyclohexane, dissociation, ring cleavages 3=25149
diamagnetic currents under mag. field 3=15375
diatomic, by collisions with atoms, classical model for arbitrary potential interactions 3=10502
diatomic, slow neutron scatt., quantum states transitions 3=25074
diatomic, thermal accommodation coeffs. of gas, theory 3=23928
dipole moments of excited states, rel. to solvent influence on spectra 3=18823
by electron scatt., low energy 3=15397
electronic states and spectra, theoretical computations 3=10500
electronic transfer and relaxation in solid media 3=10619
energy transfer between unlike mole., effect of solvent viscosity 3=23887
fluorescence polariz. in external elec. field 3=22528
by free-atom heterogeneous recombination on metal surface 3=8224
intermolecular energy exchange in collisions 3=6430
lifetime, 10^{-8} — 10^{-9} sec, meas., by modulated light 3=5514
luminescence quenching by interaction 3=2609
luminescence, theory 3=10488
methane, vibr.—rotational energy transfer 3=6414
methylamide, by thermal neutrons on liq. 3=2652
neutron scatt. with large energy transfer, theory 3=22516
organic, β -phosphoresc., temp. quenching 3=10999
organic, electronic transitions rel. to polarization and fluorescence symmetry 3=2635
 π -electrons, in polymers, 20 keV electron scatt. 3=22617
polystyrene, radioluminesc. rel. to mol. wt. 3=23117
quantized radiation field, density matrix eqns. 3=25085
radiation absorption, general theory 3=17555
radiation of beam, resonance, spectroscopy 3=6443
radiation, stimulated emission, in strong e.m. field 3=17069
sec-butyl radicals, collisional energy transfer with molecules 3=12879
sec-butyl radicals, collisional energy transfer in rare gases 3=12878
sec-butyl radicals, produced by chem. activation 3=8965
single-triplet transitions, role of ground state 3=8245
spectroscopic anomalies rel. to Jahn—Teller effect 3=19957
superexcited states 3=4735
transient state above ionization potential, pre-ionization and atomic reorganization competition 3=2675

Molecules — contd

excitation — contd

- vapour temps., from fluoresc.—absorpt. spectra
reln. 3=15320
- vibrational level pair, possibilities, for l.r. maser 3=15327
- vibrational transition in molec. collisions 3=10551
- vibronic states, by electron impact 3=22531
- xylylene, lifetime reduction in liquid scintillators 3=16629
- CD, vibr.—rotational energy transfer 3=6414
- CH, energies 3=15363
- CN, microwave transitions, optical detect. 3=6390
- CO, collision with metastable Xe atoms 3=10514
- CO⁺, u.v. excited, fluorescence 3=4753
- CO, vibration deactivation by collision 3=6441
- CO₂, vibrational relax., theory and expt. 3=22558
- D₂, C¹Π_u(2p) state Λ doubling, isotopic effect 3=2614
- D₂, electron collision cross-sections in d.c. field 3=23942
- D₂, heterogeneous perturbations between B¹Σ_g⁺(2p) and C¹Π_u(2p) states 3=2613
- H₂, C¹Π_u(2p) state Λ doubling, isotopic effect 3=2614
- H₂, electron collision cross-sections in d.c. field 3=23942
- H₂, by electron swarm, u.v. radiation 3=10515
- H₂, from electron swarm energy distrib. 3=6391
- H₂, heterogeneous perturbations between B¹Σ_g⁺(2p) and C¹Π_u(2p) states 3=2613
- H₂, proton impact, giving Balmer emissions 3=15278
- H₂, rotational collisions with He and H₂ 3=17623
- HD, heterogeneous perturbations between B¹Σ_g⁺(2p) and C¹Π_u(2p) states 3=2613
- HD, C¹Π_u(2p) state Λ doubling, isotopic effect 3=2614
- Li₂, energy, LCAO computations 3=25098
- N₂, A²Σ_g⁺ state, by microwave discharge, diffusion, lifetime 3=17573
- N₂, by Ar, metastable, in plasma stream 3=8263
- N₂, by electron swarm, u.v. radiation 3=10515
- N₂, in He, relative populations of levels 3=2621
- N₂, from electron swarm energy distrib. 3=6391
- N₂, in He, first negative system 3=2622
- N₂, long-lived metastable state at ~ 8 eV 3=2618-19
- N₂, metastable, production in elec. discharge 3=2571
- N₂, 1-6-10 eV electron scattering 3=8207
- N₂, rotation; by electrons, energy loss 3=17578
- N₂, rotational, in ionosphere D-region, electron calc. 3=3499
- N₂⁺, in afterglow of He—N₂ discharge 3=10514
- N₂⁺, u.v. excited, fluorescence 3=4753
- NH₃, resonance radiation of beam 3=6443
- NO, energy levels and spectrum 3=10517
- NO, overpopulating first vibr. level 3=6394
- NO₂, shock-heated, thermal radiation 3=728
- NO₂, electronically, dissociation 3=12872
- O₂, by protons, two-state and multistate calc. 3=25104
- O₂, Schumann—Runge band system, transition moments, detm. 3=19987
- O₂⁺, u.v. excited, fluorescence 3=4753
- S₂, S₄, Se, S₈, ionization pots. 3=1385
- SiD₄, vibr.—rotational energy transfer 3=6414
- SiH₄, vibr.—rotational energy transfer 3=6414

intermolecular mechanics

See also Association; Collision processes; Kinetic theory, gases; Liquids, structure; Liquids, theory; Solids, theory.

- adsorption of monatomic mols. on graphite 3=13572
- alcohols, normally saturated, association, rel. to solvent 3=21395
- alcohols, tertiary, intermolec. association, rel. to dielectric polarization 3=21396
- anisotropic intermol. forces, Raman line broadening 3=8226
- atoms scatt. by homonuclear diatomic mols. 3=22611
- biacetyl, energy-transfer from aromatic hydrocarbons and ketones 3=23890
- bimolecular collisions, rel. to viscosity, sound velocity and spectral line breadth 3=16660
- α-bromonaphthalene, dipole—dipole interaction, from dielectric relaxation 3=23897
- 1 : 1 charge-transfer complexes, consts. det. 3=2674
- chlorobenzene + bromobenzene, dipole—dipole interaction 3=296

Molecules — contd

intermolecular mechanics — contd

- α-chloronaphthalene, dipole—dipole interaction, from dielectric relaxation 3=23897
- cluster expansions for systems of polar molecules, solvents and dielec. props. 3=10552
- diatomic molecule—atom collisions with arbitrary potential interactions, classical model 3=10502
- dibutyl phthalate, dipole—dipole interaction, from dielectric relaxation 3=23897
- and diffusion, binary, from corresponding states low 3=16650
- dipole—dipole, contrib. to n.m.r. of spin- $\frac{1}{2}$ nuclei 3=17610
- dispersion energy between optically active mols. 3=6365
- dissociation of diatomic molecules, mean first-passage times 3=8304
- electric dipole relaxation, theory 3=22530
- in electrolyte solutions, ionic interactions 3=21375
- energy exchange, resonance and non-reson. 3=6430
- energy-transfer studies by spectrophotofluorometric method 3=23890
- equations of state, virial coeffs., and intermolecular forces organic compounds 3=25154
- ethyl benzoate, dipole—dipole interaction, from dielectric relaxation 3=23897
- Fermi resonance in Raman spectra, effects 3=10487
- Frankel-Band theory of association equilibrium 3=12877
- gas condensation for various force laws 3=24115
- gas and graphite atoms and lattice repulsion 3=20030
- gases, imperfect, effect on mag. birefringence. 3=172
- gases, rel. to nuc. relax. data 3=14222
- Hellmann—Feynmann electrostatic theorem 3=25073
- identical symmetry terms, intersection, non-adiabatic transit 3=741
- interacting mols., energy distrib. 3=12872
- interaction energy rel. to vibr. transition probab. 3=6432
- inert gas diatomic, oscillatory relaxation, rel. to triple oscillations 3=18744
- ionic association, statistical theory 3=13006
- isoamyl phthalate, dipole—dipole interaction, from dielectric relaxation 3=23897
- Lennard-Jones, fourth virial coefft., limits w.r.t. temp. 3=18848
- Lennard-Jones potential, third virial coefft. 3=7239
- liquids, force correl., rel. to collective motion 3=129
- liquids, free volume theory, mol. correl. 3=1676
- loaded spheres, kinetic theory 3=16654
- long saturated chains, London—van der Waals dispersion attraction 3=2676
- luminescent solns., excited—unexcited mols. interact. 3=1701
- methane, liquid from kinemat. viscosity 3=9423
- molecule—molec. ion exothermic reacts., kinetics 3=6438
- naphthalene—Inert gases 3=304
- neutral, differential cross-sections, meas. appar. 3=4788
- nonspherical function, ang. terms, matrix elements 3=6435
- nonspherical, kinetic theory 3=16653
- effect on n.m.r. of F 3=12865
- organic, adsorbed, mutual attraction, rel. to potential 3=20938
- organic solvents, intermol. rotation, rel. to dielectric saturation 3=21393
- pair potentials in nonpolar media 3=12880
- polar, new model, contribs. of off centre dipoles to gas second virial coeffs. 3=14204
- polyatomic, rotational-translational relaxation in dilute gases 3=1724
- potential for non-polar, quasi-spherical mols. 3=2672
- potentials, molecular beam data interpretation 3=8317-18
- reorientation in liquids, angular autocorrelation functions 3=16602
- reorientation in liquids, distrib. functions and friction consts. 3=16601
- retarded dispersion forces at zero temp. 3=6437
- scattering cross-sections, approximation formulae 3=17319
- scattering of high-velocity molecular beams 3=8315
- sec-butyl radicals — diatomic and polyatomic molecules 3=12879
- sec-butyl radicals—rare gases 3=12878

Molecules — contd

intermolecular mechanics — contd

- 7 compounds H—H intermolec. bonding, rel. to vibration freq. 3=25152
- three-body dispersion energy 3=20032
- two-centre Coulomb potl. approx. 3=22810
- Van der Waals forces for asymm. top mols. 3=22613
- van der Waals, vibr. terms, isotope effects 3=22614
- vibrational energy transfer in collisions having large transition probabilities 3=17620
- vibrational transition in collisions 3=10551
- virtal coeffts. for square-well potentials 3=25153
- water, vapour, atmosphere, saturation vapour press., rel. to density 3=18495
- Ar, in bimodal model for shock waves 3=1755
- Ar, liquid from kinemat. viscosity 3=9423
- C₂H₂, rel. to Raman spectra line breadth 3=7247
- C₂H₂ interact. with atomic and molec. ions 3=10549
- CH₄-D₂ mixtures, n irradi., failure of T elastic collision model 3=18480
- CO, rel. to Raman spectra line breadth 3=7247
- CO, rotational line broadening by HCl and Ar 3=12817
- CO₂ 3=20033
- CO₂, rel. to Raman spectra line breadth 3=7247
- CO₂, vibrational relax., theory and expt. 3=22558
- D₂-CH₄ mixtures, n irradi., failure of T elastic collision model 3=18460
- D₂⁺-D₂ collisions 3=15391
- D₂⁺-D₂ collisions, 30-100 keV 3=1931
- H halide-rare gas mixtures, absorption spectra 3=4747
- H₂, interaction energy with He atom 3=17622
- H₂-Rb atom 3=4723
- H₂, rel. to nuclear spin-lattice relax. 3=20023
- H₂, rotational excit. by He and H₂ 3=17623
- H + Cl₂ → HCl + Cl, energy distribution model 3=13593
- o- and p-hydrogen, slow neutron scatt., Schrödinger eqn. 3=4734
- He, in bimodal model for shock waves 3=1755
- Kr, liquid, from kinemat. viscosity 3=9423
- Li⁷⁺ ion bombardment, interference patterns 3=21901
- N₂ and CO, vibrational energy exchange 3=20031
- N₂-e (thermal), cross-sections, by cyclotron resonance 3=22462
- N₂, relaxation time, temp. depend. 3=8313
- NO₂ reaction with O¹⁶ 3=13598
- O₂, from intramol. oscill. relax., temp. var., from shock wave propag. 3=12881
- O₂, from intramol. oscill. relax., temp. var. from shock wave propag. 3=12881
- O₂, liquid from kinemat. viscosity 3=9423
- SO₂-CO₂, linewidth of SO₂ 3=12841
- SO₂-CH₃Br and SO₂-SO₂ collisions 3=17621
- SnBr₄, Raman spectra in crystalline state 3=15696
- SnCl₄, Raman spectra in crystalline state 3=15696
- T, in CH₄-D₂ mixtures, n irradi., failure of elastic collision model 3=18460
- TiCl₄, Raman spectra in crystalline state 3=15696

internal mechanics

- acetaldehyde, internal motion rel. to J-coupling 3=737
- alkali hydrides, potential energy curves 3=17569
- atomic interaction problems, using semiclassical model 3=2573
- benzene, isotopically substituted, zero-point energy 3=12794
- bonds, derivation from e.s.r. meas. 3=17611
- carbonyls, Group VI, phosphine-substit. 3=6397
- diamagnetism, molecular-orbital theory 3=8240-1
- diatomic homonuclear mois., forces on nuclei 3=25079
- diatomic, spin-spin and spin-orbit interactions, similarity 3=722
- diatomic, potential energy function, modified 3=22537
- diatomic, relative partial wave theory 3=22517
- dimethyl sulphide, internal barrier potential 3=2644
- ethane, isotopically substituted, zero-point energy 3=12794
- ethylene, isotopically substituted, zero-point energy 3=12794
- ethylene, potential function calc. 3=4767
- force const. matrix with redundant coord. 3=8233
- force const. calc., computer programme 3=8234
- force const., XY₂, XY, XY₂Z mols. 3=15325
- force field in terms of coords. under constraint 3=19961

Molecules — contd

internal mechanics — contd

- free const., XY, XYZ, mols. 3=15328
- fundamental molecular const., general relation between two electronic states 3=10499
- group IV tetrahalides, force constants calc. 3=6376
- Hellmann-Feynmann electrostatic theorem 3=25073
- hydrazine, amino group rot. 3=10509
- interatomic potentials, eigenvalues 3=15317
- internal rotation barriers by solid phase thermal analysis 3=25197
- internal rotation, restricted, potential functions 3=25082
- isotopic homologues and isomers, zero-point energy 3=12773
- magnetic props. from one-centre wavefunctions 3=17565
- maser, optical, SmR₂, EuR₂ (R is organic radical), possibilities 3=17072
- methane, isotopically substituted, zero-point energy 3=12794
- nonadiabatic transitions, probab. for nondivergent terms 3=15330
- one-dimensional wave eqn., iterative solution 3=15317
- organic, Eu, Sm, for possible maser, optical 3=17072
- porphyrins, fluorescence polarization 3=2650
- potential-energy function, differential eqn. 3=17550
- potential, rel. to "rainbow" effect in scattering 3=12784
- Raman scattering, rel. to electronic absorption spectra 3=15319
- refractivities 3=15332
- spin-spin coupling Hamiltonian in multiplets 3=19968
- Stark energy levels of symmetric-top molecules 3=17564
- symmetry groups of non-rigid molecules 3=22518
- valence force fields, including intramol. tension 3=17551
- wave-functions, new approx. calc. method 3=2603
- zero-point energies calc., perturbation methods 3=12795
- zero-point energies calc. using Taylor's series 3=12794
- B₂H₂, molecular orbitals 3=12816
- B₁₀H₁₂, molecular orbitals 3=12816
- C₂, x¹Σ_g⁺ and b¹Π_u states 3=8251
- CCl₄, force const. from vibr. data 3=6376
- CF₄, force const. from vibr. data 3=6376
- CO⁺, Morse potentials 3=4743
- ClF₃, force constant calc. 3=15344
- EuR₂ (R is organic radical), for possible maser, optical 3=17072
- GeCl₄, force const. from vibr. data 3=6376
- GeCl₄, valence force fields calc. 3=17551
- GeDCl₃, valence force fields calc. 3=17551
- GeHCl₃, valence force fields calc. 3=17551
- H, para, conversion to MgO adsorbed equilibrium, below 20°K, endothermic 3=20994
- H₂, binding energy, relativistic corrections 3=4746
- H₂, isotopically substituted, zero-point energy 3=12794
- H₂, mag. props. from one-centre wavefunctions 3=17565
- H₂, perturbation theory approach 3=2615
- H₂, rotational-relax. freq., rel. to temp. 3=14212
- H₂⁺, force constants 3=10499
- H₂⁺, one two and three-centre wave functions 3=22541
- (H₂)⁺, relative partial wave theory 3=22517
- HF, breathing force const., one-centre calc. 3=22564
- HNCO, Urey-Bradley force field, and thermodynamic props. 3=12799
- HNCS, Urey-Bradley force field, and thermodynamic props. 3=12799
- H₂O, breathing force const., one-centre calc. 3=22564
- H₂X (X=O, S, Se), force constants, comparison 3=8277
- He₂⁺, binding energy, new lower limit 3=723
- He⁺, three-body bound state, binding energy 3=25109
- He-He, united-atom configuration-interaction 3=10508
- HgI₂⁺, force const. from Raman spectrum 3=6402
- IF₃, potential constants and thermodyn. props. 3=2630
- N₂, compressed, spectrum, far i.r., rot., collision induced dipole moments 3=17580
- ND₂CN, force const. 3=22570
- ND₃, Urey-Bradley force field, and thermodynamic props. 3=12799
- NH₃, breathing force const., one-centre calc. 3=22564
- NH₃, force constants, crystalline, gaseous, liquid 3=22566
- NH₃, harmonic force constants 3=2632

Molecules — contd

internal mechanics — contd

- NH₃, Urey-Bradley, force field 3=12789
 NH₃CN, force consts. 3=22570
 NHDCN, force consts. 3=22570
 NO, electronic-vibr. energy conversion 3=6394
 PO, potential energy curves 3=17582
 ReF₆, equil. config. 3=2623
 SCCl₂, force consts., in plane vibrations, compared with OCCl₂ 3=19998
 SiBr₄, potential consts. calc. 3=17588
 Si(CH₃)₄, potential consts. calc. 3=17588
 SiCl₄, potential consts. calc. 3=17588
 SiCl₄, valence force fields calc. 3=17551
 SiDCl₃, valence force fields calc. 3=17551
 SiD₂NCS, potential energy consts. 3=22573
 SiF₄, potential consts. calc. 3=17588
 SiH₄, potential consts. calc. 3=17588
 SiHCl₃, valence force fields calc. 3=17551
 SiH₂NCS, potential energy consts. 3=22573
 SiI₄, potential consts. calc. 3=17588
 SmR₃ (R is organic radical), for possible maser, optical 3=17072
 SnCl₄, force consts. from vibr. data 3=6376
 XeF₄, XeF₆, binding mechanism 3=15357
 XeOF₄, Xe—O stretching force const. 3=17590

moments

- alkali metals, rotational mag., by molecular beam 3=19974
 n-amyamine, dipole, and mol. polariz. 3=2638
 aromatic, dipole, from spectr. data 3=2605
 benzonitrile and isotopic species 3=2640
 carbonyl fluoride 3=6410
 cis-crotonitrile 3=17594
 difluoramine 3=8274
 dimethyl ether 3=17596
 dipole, ground and first excited states 3=2605
 dipole-moment function for diatomic molecules 3=17567
 dipole moments of excited states, rel. to solvent influence on spectra 3=18823
 dipole, of excited mols., from fluorescence 3=22528
 ethane, polarizability, classical calc. 3=20008
 formic acid 3=6412
 measurement, spectroscopy method for solutions 3=2604
 methyl fluoride 3=17601
 monofluoroacetonitrile, elec. dipole moment 3=4772
 organic, various, dipole moment derivs. calc. 3=6405
 phthalimide derivatives, dipole, in first excited singlet state 3=20010
 phthalimide derivs., first and second excited states 3=4739
 polyatomic molecules, dipole moments, in ground and excited states, spectrosc. determ. 3=22529
 silyl acetylene, dipole, from microwave spectrum 3=25132
 XYZ, type, Urey-Bradley force field 3=12797
 XY₂Z type, Urey-Bradley field 3=12798
 AlF₃, dipole, from spectrum microwave 3=19973
 BrCl, dipole moment 3=25141
 CH₄, BH₄⁺, NH₄⁺, isoelectronic systems, multipole moments 3=22554
 CO₂, quadrupole 3=12841
 CO₂, quadrupole moment 3=12834
 CdI₂ amine complex, dipole mom. 3=15358
 Co, dipole, calc. 3=19977
 Cu(II) complexes, mag. moments calc. 3=22560
 F₂HC—CDHF, dipole, from Stark effect, 7-25 kMc/s 3=17593
 H₂, rotational mag., by molecular beam 3=19974
 H₂O, electric dipole, sign, from Landé factors 3=22562
 LiD, rotational magnetic 3=15337
 LiH, rotational magnetic 3=15337
 Li^{6,7}F¹⁹ 3=10510
 Li^{6,7}H₂, dipole, and rotational magnetic 3=4752
 cis—N₂F₂, dipole moment 3=25111
 NH₃, atomic polarization meas. 3=3838
 NH₃, electric, radioelec. meas. 3=3838
 NaF, elec. dipole moment 3=22550
 O^{17,18}H, dipole moments, h.f.s. 3=12828
 XeF₄, second moments 3=12868
 ZnCl₂ amine complex, dipole mom. 3=15358

Molecules — contd

nuclear coupling

- acetaldehyde, proton spin-spin coupling, -119° to 52°C 3=737
 aromatic free radicals 3=8309
 aromatic free radicals, C¹³ coupling const. 3=15384
 carbon groups, spin-spin coupling rel. to electronegativity 3=4783
 chemical shifts of n.m.r., theory 3=15375
 chlorodifluoromethane 3=6411
 trans-1-chloropropylene, quadrupole coupling consts. 3=2642
 cyclobutanes, proton spin-spin coupling consts., relative sign 3=8296
 diatomic molecules, higher-order spectroscopic parameters, empirical potl. func. 3=22524
 2, 3-dibromopropionic acid, proton spin coupling constants 3=736
 difluoramine 3=8274
 dinitrobenzene anion radicals, e.s.r. splitting constants for each nucleus 3=4776
 e.q.r. consts., effects of intramolecular elec. fields 3=2659
 ethyl bromide, quadrupole coupling const. tensor 3=17597
 ethylenes, subst. C¹³-H spin-spin 3=10547
 2-fluorobenzotrifluorides, J_{FF} in CF₃ group 3=25143
 with four spin- $\frac{1}{2}$ nuclei, n.m.r. in liquid state 3=147
 fluorocarbons, F coupling consts., relative signs 3=15377
 in gases, effect on Zn virial coeff. 3=21436
 hexanediamine, quadrupolar 3=2656
 isopropyl cpds., types A⁶B, A⁶BX 3=10542
 Jahn-Teller effect dynamical 3=22527
 ketlys, constants and spin densities by e.s.r. spectra 3=4777
 methanes, substituted, C¹³-H, spin-spin, rel. to chem. shift 3=20022
 monochloroacetonitrile, quadrupolar 3=2656
 n.m.r. of O¹⁷, coupling with P³¹ 3=11810
 n.m.r. spectra calc., "direct" method 3=15361
 n.m.r. spectra, direct analysis 3=15380
 naphthalene free radicals, C¹³ coupling const. 3=15384
 nitrogen heterocyclics, spin-orbit coupling and radiationless processes 3=17604
 organic, indirect spin-spin, between protons and C¹³ 3=12862
 4-picoline, quadrupolar 3=2656
 polymers, proton spin decoupling in structure studies 3=25158
 relative signs of nuclear spin coupling consts. 3=10548
 spin-spin, geminal, hyperconjugation effect 3=22520
 spin-spin, rel. to effect on n.m.r. of elec. field 3=6419
 pyridine, quadrupolar 3=2656
 1,1,4,4-tetramethylcyclohexyl-cis-2,6 diacetate, relative signs of geminal and vicinal coupling consts. 3=2663
 BrCl, quadrupole coupling of Cl isotopes 3=25141
 C—C and C—H bonds, diamag. anisotropy 3=22585
 C¹³-H, valence-bond dependence upon substituents 3=2661
 (CH₃)₂C³⁵Cl, quadrupole coupling 3=4769
 CH₃CH₂HgX, between H¹ and Hg¹⁹⁹, spin coupling 3=25145
 CH₃HgX, between H¹ and Hg¹⁹⁹, spin coupling 3=25145
 F¹⁹ n.m.r., C¹³ satellite spectra analysis 3=15386
 Fe-nitrosyl complexes, Mössbauer effect interpretation 3=25125
 H—C—H, rel. to substituents, Hooke formula 3=720
 H₂—Rb, spin-orbit interact., spin relaxation 3=4723
 Hg¹⁹⁹, n.m.r. shifts, shielding consts. 3=15378
 LiH, Li⁷ quadrupole moment 3=25099
 Pb²⁰⁷, n.m.r. shifts, shielding consts. 3=15378
 SF₆Br 3=22572
 Si²⁸—H, valence-bond dependence upon substituents 3=2661
 Ti²⁰⁶, n.m.r. shifts, shielding consts. 3=15378
 XeF₄, F¹⁹—Xe¹²⁹ spin-spin coupling 3=17617
 XeOF₄, F¹⁹—Xe¹²⁹ spin-spin coupling 3=17617

relaxation

- See also Acoustic wave propagation; Dielectric phenomena; Liquids, theory; Nuclear magnetic resonance and relaxation; Paramagnetic resonance and relaxation.
 Ampere Colloquium, Eindhoven (1962) 3=20629
 Ampere Colloquium, Leipzig (1961) 3=23198
 electronic, in solid media 3=10619

Molecules — contd**relaxation — contd**

- experiments interpret. w.r.t. energy exchange probab. 3=6379
- gas pressure broadening, as relax. process 3=16663
- in gases, thermal relaxation 3=22609
- halogens, gaseous, relaxation times 3=9504
- liquids, mag. relax., mol. shape effect 3=21405
- in liquids, thermal relaxation 3=22609
- polar molecules, in soln., calc. 3=1708
- polymers, time spectrum, heuristic deriv. 3=4794
- relaxation times, from thermal spiration meas. 3=22608
- reorientation in liquids 3=16601
- reorientation in liquids 3=16602
- solvents, during solute excited lifetime, fluorescence spectral effects 3=9468
- vibrational, coupling to translational motion 3=8236
- vibrational, with dissociation, moment eqns. 3=8306
- CO, shock-tube study of vibrational relaxation 3=7243
- CO₂, vibrational, theory and expt. 3=22558
- H₂, rotational-relax. freq., rel. to temp. 3=14212
- He-N₂ mixtures, rotational relax. due to He 3=6431
- He-O₂ mixtures, rotational relax. due to He 3=6431
- N₂, vibrational 3=20031
- NO, vibrational, meas. and theory 3=6394
- O₂, vibrational relaxation, acoustic study 3=9506

vibration, rotation

- about double bond and apparent asymmetry 3=20003
- acetonitrile, rotational barriers 3=8286
- alkali hydride, potential-energy curves of excited states 3=12815
- allene, Urey-Bradley force field 3=20004
- anharmonic corrections in triatomic molecules with Renner effect 3=12800
- anilines, para-substituted, C-N stretching freqs. 3=2639
- anthracene, anthracene-d₁₀, in plane modified Urey-Bradley, calc. 3=22580
- anthracene, C-H bond, planar bending, anomalous, -180 to 20°C 3=22577
- asymmetric rotator const., calc. from energy moments 3=4737
- asymmetric-top vibration-rotation Hamiltonians 3=8229
- atmosphere, vibr. excitation, effects 3=137
- benzene, crystalline, films 3=13191
- benzene, vibronic-spin-orbit perturbations and assignment of lowest triplet state 3=8289
- bonds, C-H, stretching and planar bending, -180 to 20°C 3=22577
- bonds, H, in organic mols., by i.r. spectroscopy, proposed study 3=6378
- butyronitrile, rotational isomers 3=6409
- carbonyls, Group VI, phosphine-substit. 3=6397
- chlorodifluoromethane 3=6411
- cis-crotonitrile, barrier to rotation 3=17594
- centrifugal distortion effects in asymm. rotator 3=2595
- centrifugal distortion effects in asymmetric rotors 3=8278
- in cetyl alcohol crystals, rotation 3=15958
- collisions, rotational energy transfer, theory 3=6435
- collisions, vibr. transition probab., theory 3=6432
- compliance matrix and vibrations 3=8230
- compounds, vib. freq. rel. to intermolec. H-H bonds 3=25152
- conjugated systems, "rearrangement charges" 3=6405
- cyanamide, rot. const., corrected 3=2649
- cyanamide, vibrational spectra calc. 3=4764
- cyclohexane, rotational barriers 3=8286
- diatom. bound vib. states, atomic beam scatt. 3=4726
- diatomic, excited by collisions with atoms, classical model 3=10502
- diatomic molecules, electron-vibrational bands, relative intensities 3=22534
- diatomic molecules, higher-order spectroscopic parameters, empirical potl. func. 3=22524
- diatomic molecules, vibration, rel. to internuclear distance 3=10501
- diatomic molecules, vibrational relax. in dissociation 3=15388
- diatomic, pressure broadening of bands 3=9510
- 1, 2-difluorobenzene, vibrational assignment 3=8291

Molecules — contd**vibration, rotation — contd**

- dimethyl sulphide, torsional fine structure 3=2644
- difluoramine, rotational const. 3=8274
- dihedral, electronically degenerate, rotational levels 3=718
- dissociation and isomerism, unimol. reaction theory 3=3386
- electron, maser scheme, 4 level 3=22001
- electronic energy relaxation (internal conversion and intersystem crossing) in solid phase 3=2748
- energy exchange probab., rel. to relax. expts. 3=6379
- energy levels, rotational, classification 3=25080
- ethane, rotational const. 3=4766
- ethyl bromide, barrier to rotation 3=17597
- ethyl fluoride, far i.r. spectrum, barrier to internal rotation 3=25121
- excitation of diatomic molecules by collision 3=8314
- excitation, possibilities, for i.r. maser 3=15327
- Fermi resonance, effect of intermol. interact. 3=10487
- force const. calc., computer programme 3=8234
- force constants of 33 tetrahedral XY₄ types 3=8235
- force constants, pot. energy of vibr. molecule 3=25081
- force constants, theoretical interpretation 3=10491
- force constants, XY₂Z type mols. 3=8280
- force field in terms of coords. under constraint 3=19961
- formaldehyde, (6.3) rotational spectrum 3=25122
- formamide, force const., calc. 3=2648
- Franck-Condon principle and ionization 3=8228
- free radicals, hindered internal rotation effects 3=12861
- group IV tetrahalides, normal coord. transforms. 3=6376
- halogens, gaseous, relaxation times 3=9504
- hexafluoride molecules, Jahn-Teller effect in E_g vibrational mode 3=12839
- hindered rotation in solids 3=15417
- holmium ethyl sulphate, zero field splitting 3=8600
- interactions between vibrations and hindered rotation 3=4736
- intermolecular energy exchange in collisions 3=6430
- internal rotation barrier, new calc. method 3=12801
- internal rotation of completely asymmetric molecules 3=8288
- internal rotation, restricted, potential functions 3=25082
- ions, electron capture by rotat. excitation 3=21715
- ketene and deuteroketenes, fundamental vibrational frequencies 3=12854
- ketene, vibrational potential function 3=17600
- L-type doubling and resonance, interpret. 3=19960
- level density, semi-classical approx. accuracy 3=19962
- linear mols., vibr.-rot. interaction theory 3=8232
- in liquids, energy dissipation processes 3=3794
- liquids, nonspherical Brownian rotat. rel. to mag. relax. 3=5449
- long molecules with conjugated bands, electron interactions 3=15402
- meta-fluorochlorobenzene, spectra, 10.5-26.3 Gc/s 3=4768
- methane-d₂, analysis of two i.r. bands 3=12855
- methane-d₄, 2ν₃, vibr.-rot. interact. 3=6413
- methane, deuterated (CH₃D), from spectrum, 400-6000 cm⁻¹ 3=22587
- methane, ν₃ band, rotational structure 3=22586
- methane, 2ν₃ and 2ν₄, vibr.-rot. interact. 3=6413
- methane, vibr.-rotational energy transfer 3=6414
- methanol, Urey-Bradley force const. 3=8292
- methyl alcohol, σ-Stark effect of rotational transitions 3=734
- methyl-fluoro-silane series, potential functions 3=20011
- methylamide, excitation by thermal neutrons 3=2652
- methylgermane 3=17603
- modified sum rule for vibrational freq. of symmetrical isotopic molecules 3=10493
- molecular crystal, intermolecular vibrations, rel. temperature dependence i.r. absorption 3=15662
- monofluoroacetonitrile 3=4772
- naphthalene, vibration symmetry types 3=17605
- oxides, diatomic, Franck-Condon factors 3=22536
- perturbed oscillators, with Gaussian barriers 3=22523
- phosphoryl halides, potential const. 3=2634
- planar asymm. mols., first-order centrifugal distortion 3=6380

Molecules — contd

vibration, rotation — contd

- polyatomic, system, anharmonicity consts. interrel. 3=2599
- polyatomic; bond distance and angular centrifugal distortion 3=2607
- polyatomic, tables 3=15323
- polyethylene, vib. 3=10556
- polyethylene glycol, normal vibrations 3=6444
- polyoxymethylene, normal vibrations 3=10557
- polypropylene, isotactic, vibrations 3=17624
- polymers, vibrational effects in exciton motion 3=10561
- n-propyl chloride, trans and gauche 3=25130
- pyrene, vibrational assignments, 4000–400 cm^{-1} 3=25468
- pyridine, and deuterioisomers, coordinates of planar vibrations 3=8293
- quartic oscillator, energy levels and matrix elements 3=14030
- quasispherical molecules, in liquids, rotary mobility 3=21301
- Raman overtones of intramol. vibr., intensities 3=10486
- Raman spectra analysis 3=17553
- from Raman spectra line shape 3=19963
- resonance absorption 3=5031
- rotating anharmonic triatomic molecule, dynamics 3=10489
- rotation, hindered, in neutron scatt. 3=17284
- rotation in liquids, n.m.r. study 3=14143
- rotational levels of nearly degenerate pairs of vibronic states 3=10490
- rotators, systematic, Wigner expansions 3=6381
- sec-butyl radicals, collisional energy transfer in rare gases 3=12878
- sec-butyl radicals, collisional energy transfer with molecules 3=12879
- silyl acetylene, rotational consts. 3=25132
- silyl halides, potential constants and thermodynamic props. 3=8280
- simple molecules, spectra, NBS programme 3=9591
- spectra, rotational lines, random model application 3=17559
- spectroscopic anomalies rel. to Jahn–Teller effect 3=19957
- spherical rotational diffusion, rel. to light scattering in liquids 3=15329
- Stark effect of asymmetric-top rotator 3=8231
- substituted benzaldehyde ions, rotational isomerism 3=15373
- temperature effect on electron diffraction patterns 3=17549
- tertiary butyl chloride 3=12849
- thiophosphoryl halides, potential consts. 3=2634
- toluene, rotational barriers 3=8286
- torsional vibrations in $\text{CH}_3\text{-X}$ type molecules 3=19959
- trans-1-chloropropylene, internal rotation barrier 3=2642
- triatomic molecules, vibr. energy redistrib. in Fermi resonance 3=15330
- true vibrational wavefunctions, effect of vibration–rotation interaction 3=10492
- Urey–Bradley force field, adaptation to NH_3 , PH_3 , SbH_3 , and AsH_3 3=22552
- Urey–Bradley force field for pyramidal XYZ_2 molecules 3=2626
- vibrational effects on bond lengths and angles 3=15328
- vibrational energy exchange 3=2546
- vibrational energy-level sums, calc. method 3=17556
- vibrational energy transfer in collisions having large transition probabilities 3=17620
- vibrational relax., coupling to translation 3=8236
- vibration–rotation interact., general form 3=2596
- vibrational–rotational bands, transition probabs. calc. 3=23628
- vibrational spectra of spin-degenerate molecules, Jahn–Teller effect 3=717
- vibrational transition probabs, calc. 3=12803
- viscous solns. of complex organic cpds., optical absorption 3=23881
- water, slow neutron scatt., small-energy rotation transitions 3=23869
- Wilson GF and Mean–Polo C matrices 3=10485
- w.k.b., for calc. Franck–Condon factors and r-centroids 3=15324

Molecules — contd

vibration, rotation — contd

- XH_2 type, relation between symmetric and anti-symmetric frequencies 3=17558
- XY_2 -type pyramidal, bond distance and angular centrifugal distortion 3=2607
- XY molecules, normal coord. analysis 3=2631
- XYZ_2 molecules, Urey–Bradley force field 3=2626
- AlAu , rotational analysis of spectra 3=10505
- AsH_3 , Urey–Bradley force field 3=22552
- AuBa , AuCa , AuSr 3=19979
- B_2O_3 3=8272
- B(OD)_3 , in-plane vibrs., force consts. and freqs., calc. 3=22555
- B(OH)_3 , in-plane vibrs., force consts. and freqs., calc. 3=22555
- BaO , rotational consts. 3=17570
- $\text{Ba(OH)}_2 \cdot 8\text{H}_2\text{O}$, OH bond orientation 3=4968
- BaTiO_3 , from i.r. spectra 3=23064
- BeO ($\text{R}^2\Sigma^+ - \text{X}^2\Sigma^+$) system, transition probabs. 3=8249
- BiBr , emission spectrum, $\text{A} \rightarrow \text{X}$ system analysis 3=6389
- BrCN 3=12834
- BrF_3 , force consts. 3=2631
- C_2 , $\text{A}^1\Sigma_g^+ - \text{X}^1\Sigma_g^+$ system, analysis 3=8250
- C_2 , spectral energy distrib. rel. to hydrocarbon arc temp. 3=7484
- C_2 , $\text{x}^1\Sigma_g^+ \text{ and } \text{b}^1\Pi_u$ states 3=8251
- CBr_4 , crystalline and in soln. 3=15677
- $(\text{C(CH}_3\text{)CH})_2$, internal rotation isomers 3=25082
- CCl_4 , normal coord. transformations 3=6376
- $(\text{CClFH})_2$, internal rotation isomers 3=25082
- CD_4 , vibr.–rotational energy transfer 3=6414
- CF_4 , normal coord. transformations 3=6376
- CF_3SD , barriers to internal rotation 3=6401
- CF_3SH , barriers to internal rotation 3=6401
- CH^+ ($^2\Pi - ^1\Sigma$) cometary band, rot. temp. 3=25118
- CH , assignments 3=15363
- C_2H_2 , vib. and rot. consts. 3=10531
- CH_6 , in its β -quinol clathrate, 15°–100°K, from heat capacity 3=8284
- $\text{C}_6\text{H}_2\text{O}_6 \cdot \text{H}_2\text{O}$, OH bond orientation 3=4968
- $\text{C}_{12}\text{H}_{10}\text{O}_6$, OH bond orientation 3=4968
- $(\text{CH}_3)_2\text{X}$ type, torsion vibration theory 3=2598
- CH_2DCOH , CD_3HCOH , microwave rotational spectrum, analysis 3=8288
- CHF_3 , vibr. states, pure rotational anomalies 3=2646
- CHOOCH_2D , microwave rotational spectrum, analysis 3=8288
- $(\text{CH}_3)_2\text{S}$, torsion vibration theory 3=2598
- CN , $\text{A}^2\Pi$ and $\text{X}^2\Sigma$ states analysis 3=2611
- CN , rotational intensity anomalies 3=8253
- CO , in its β -quinol clathrate, 15°–100°K, from heat capacity 3=8284
- CO , rotational line broadening by HCl and Ar 3=12817
- CO , vibrational fluorescence 3=16665
- CO , vibrational transition probabs. calc. 3=12803
- CO_2 , i.r. absorption lines, 5.3–4.6 μ 3=19991
- CO_2 , vibration deactivation by collision 3=6441
- CO_2 , vibrational relax., theory and expt. 3=22558
- CO_2 ion in aragonite minerals, out-of-plane bending 3=25189
- C^{18}O , i.r. spectra, rotational perturb. 3=6399–400
- $\text{C}_2\text{O}_4\text{H}_2 \cdot 2\text{H}_2\text{O}$, OH bond orientation 3=4968
- $\text{C}_2\text{O}_4\text{H}_2$, OH bond orientation 3=4968
- ClO_2 , centrifugal distortion effects and potential consts. 3=6398
- ClO_2 groups characteristic vib. frequencies 3=12838
- Co , fourth positive system, Franck–Condon factors, calc. 3=17571
- Co(III) complexes, spin-forbidden band, rotation 3=22557
- $\text{DON}^{14,18}\text{O}$, rel. to u.v. absorpt. 3=6403
- D_2SO_4 , normal vibr. freqs. and thermodyn. props 3=12842
- F_2CO , excited vibr. states 3=12836
- $\text{F}_2\text{HC}-\text{CDHF}$, from Stark effect, 7–25 Mc/s 3=17593
- GaO , $^2\Sigma^+ \rightarrow ^2\Sigma^+$ transition 3=25093
- GeCl_4 , normal coord. transformations 3=6376
- H halides, spectral lines, pressure effects 3=6377
- H_2 , ground state constants 3=8254
- H_2 , para, rotational energy transfer, theory 3=6435
- H_2 , para, and velo. and absorpt. acoustic waves, u.s., 25.2° C 3=14213
- H_2 , pressure-induced i.r. absorption 3=9512
- H_2 , vibrational levels associated with Heitler–London potential 3=19981

Molecules — contd**vibration, rotation — contd**

- H₂ vibration levels, muonium scattering 3=2291
 H₂—HD collision with rot. transition, calc. 3=6436
 HCl, vibrational transition probabs. calc. 3=12803
 HF, fundamental band, vibr.—rot. interact. consts. 3=2617
 HI, ν_{0-1} band 3=19993
 HI 3=4749
 HNC, force constants 3=22584
 HO₂, force constants 3=17586
 H₂O, rotation in solid Ar, i.r. spectra 3=2628
 HON^{14,15}O, rel. to u.v. absorpt. 3=6403
 H₂S, and velo. and absorpt. of acoustic waves, u.s., 25°C 3=14213
 H₂S, Stark effect calc. 3=8231
 H₂S₂, barriers to internal rotation 3=6401
 H₂SO₄, normal vibr. freqs. and thermodyn. props. 3=12842
 HeH⁺, ground state 3=12821
 Hg halides, vibrational spectra of molten salts 3=9460
 Hg halides, vibrational spectra of molten salts 3=9461
 Hg* → CO, electronic vibrational transfer, rel. to i.r. emission 3=10506
 HgI₂⁺, vibr. freqn. from Raman spectrum 3=6402
 IF₅, force consts. 3=2631
 Li^{6,7}H, spin rot. const. 3=4752
 LiD, rotational mag. moment 3=15337
 LiH, fundamental band strength calc. 3=12803
 LiF¹⁹, rotational consts. 3=10510
 LiH, rotational mag. moment 3=15337
 LiOH.H₂O, OH bond orientation 3=4968
 Li₂SO₄.H₂O, OH bond orientation 3=4968
 MoF₆, mean vib. amplitudes 3=15350
 N-dimensional total orbital ang. momentum operator 3=18692
 N₂, compressed, spectrum, far i.r., collision induced dipole moments 3=17580
 N₂, Goldstein—Kaplan bands, structure 3=8262
 N₂, in its β -quinol clathrate, 15°–100°K, from heat capacity 3=8284
 N₂, rot. excitation in ionospheric D-region, electron cooling 3=3499
 N₂, rotation excit. by electrons, energy loss 3=17578
 N₂, rotational transitions due to He 3=6431
 N₂, vibrationally excited, calorimeter study 3=12824
 N₂⁺, D² Π_g –A² Π_u bands, and origin wave-numbers 3=22547
 N₂⁺, population distrib. in vib. levels 3=10514
 ND₃, vibr. relax., by u.s. velocity dispersion 3=22567
 ND₂CN, in-plane vibrations 3=22570
 N₂F₄, Raman spectrum, and two molecular forms 3=22569
 NH₃, Urey—Bradley force field 3=22552
 NH₃, vibr. relax. by u.s. velocity dispersion 3=22567
 NH₂CN, in-plane vibrations 3=22570
 NHDCN, in-plane vibrations 3=22570
 NH₄H₂PO₄, NH₄⁺ vibr., from i.r. absorpt. spectra 3=15342
 NH₂OH and NH₂OH-d₃, freqs., from force consts. 3=4760
 NO 3=10517
 NO, absolute intensity of 5 μ fundamental 3=15339
 NO, energy transfer in fluorescence 3=8265
 NO, vibrational relax., meas. and theory 3=6394
 NO, vibr. rate meas. in shock wave 3=7274
 N₂¹⁴O¹⁴, vibr.—rot. bands at 4.5 μ 3=6404
 NS, B³ Π –X³ Π system, vibr. analysis 3=12825
 N¹⁴S, N¹⁵S, β - and γ -band systems 3=10519
 NaF, rotational consts. 3=22550
 NiBr, vibrational analysis, rel. to band heads 4000 to 4500 Å 3=10512
 O₂, excitation by impurities, high temp. 3=17581
 O₂⁺, first negative vibrational system 3=8266
 O₂, from O + NO₂, spectrum, kinetic 3=25818
 O₂, Hopfield's emission bands 3=8267
 O₂, rotational transitions due to He 3=6431
 O₂, vibr. rate meas. in shock wave 3=7274
 O₂, vibrational relaxation, acoustic study 3=9505
 O₂, vibrational relaxation, acoustic study 3=9506
 OF₂, quadratic potential consts. 3=8278
 OH, vibrational transition probabs. calc. 3=12803
 PD₃, vibr. relax., by u.s. velocity dispersion 3=22567

Molecules — contd**vibration, rotation — contd**

- PFCl₂, Urey—Bradley force field 3=2626
 PH₃, Urey—Bradley force field 3=22552
 PH₃, vibr. relax., by u.s. velocity dispersion 3=22567
 PO, C' state, B_v' and r_v' values 3=17582
 PO₂, groups characteristic vib. frequencies 3=12838
 PbS, rotational analysis of absorption spectrum 3=10511
 RbH, spectra, Franck—Condon factors and r-centroids 3=4757
 ReF₅, mean vib. amplitudes 3=15350
 ReF₅, rotl. Raman spectrum 3=2623
 RhF₃ 3=12839
 RuF₃ 3=12839
 S₂, trapped at 20°K, vibration spectra 3=2624
 S₂, B³ Σ^- –X³ Σ^- perturbations 3=12831
 SF₆, mean square vibration amplitude 3=25113
 SO₂, rotl. spectrum in 1st vib. level 3=15353
 SO₂, rotation spectrum 3=4763
 SO₂, Stark effect calc. 3=8231
 S³⁴O₂, rot. spectrum in first vibr. excited state, distortion coeffs. 3=15351
 SbBr, spectrum, emission, vibr. analysis 3=22539
 SbH₃, Urey—Bradley force field 3=22552
 SeF₆, mean square vibration amplitude 3=25113
 SeO₂XY 3=15352
 [SeOXY]⁺ 3=15352
 Si₂, vibr. and rotl. consts. of ³ Σ states 3=8268
 SiCl, vibr. analysis of B–X bands 3=10522
 SiD₄, vibr.—rotational energy transfer 3=6414
 SiD₄NCS, vibr. mean amplitudes 3=22573
 SiH₄, vibr.—rotational energy transfer 3=6414
 SiH₄NCS, vibr. mean amplitudes 3=22573
 SnCl₄, normal coord. transformations 3=6376
 Sr(OH)₂.8H₂O, OH bond orientation 3=4968
 SrTiO₃, from i.r. absorpt. spectra 3=23064
 TiO, Franck—Condon factor for α -system 3=22551
 TiO, Franck—Condon factors, (0,0),(0,1) bands, calc. 3=15340
 TiH, rotational consts. 3=8270
 U–O bond, force const., in UO₂²⁺, from K₂UO₂F₆ spectrum, i.r. 3=22575
 VO, Franck—Condon factor for ³ Δ –³ Δ system 3=22551
 Va–O compounds, from spectrum, i.r. absorpt., and structure 3=22574

Molecules, mesic

- μ^+ , formation conditions 3=25160
 μ -mesic, nuclear fusion and vibr., calc. 3=12888
 μ -mesic, three-body, analytic approx. 3=10484
 μ^- -mesonic, formation rates in liq. H₂, direct meas. 3=4795

Molybdenum

- adsorption of Au, 2 × 10⁻⁶ torr 3=5149
 adsorption of CO and N, by films 10⁻⁶–10⁻⁸ mm, –195°–+22°C 3=16146
 antiferromagnetism, absence, by neutron diffraction study 3=3141
 arc, electric in Ar, plasma flame jet, temp. meas. 3=16921
 arc initiation 3=9756
 b.c.c., dislocation uncertainty 3=20174
 band structure from X-ray spectra 3=4979
 brittle cracks, nucleation on twin and grain boundaries 3=6803
 cathodes, in glow tubes, characteristics 3=4054
 crystal dislocations, on deformation, var. stress 3=22772
 crystals, X-rays, anomalous dispersion corrections 3=6833
 defect clusters, rel. to fission fragment irradiat. 3=17803
 desorption energy of Ag 3=23521
 diffusion in α - and γ -iron 3=22818
 diffusion in W(15 at.%)–Mo, electric field effects 3=20237
 dislocation pinning effects 3=23313
 elastic consts., 4.2°–300°K 3=13325
 electrochemical test for distinguishing from W and NiCoFe 3=9311
 electron emission by H⁺ ions at 1–30 keV 3=24347
 electron emission due to He⁺ and Ar⁺, 0.1–2.5 keV 3=4185
 electron emission due to rare gas ion effects 3=9843
 electron emission charac. in gases 3=418
 electron emission, secondary, energy distrib., on electron bombardment at 100–1000 eV 3=12240

Molybdenum — contd

- electron scattering, energy loss 3=2040
- electronic band structure, by De Haas-Van Alphen meas. 3=6492
- energy band structure by isochromat meas. 3=15468
- enthalpy, 0-2400°C 3=20102
- dislocations, at isolated grains in single crystal matrix 3=6529
- Fermi surface area from skin effect meas. 3=2757
- films, vacuum deposition, using spring-loaded conductors 3=9524
- fission fragment damage tracks 3=15526
- H⁺ and He²⁺ bombardment damage 3=2850
- hardening, irradiation, rel. to grain boundaries 3=4881
- heat capacity, 0-2400°C 3=20102
- lattice defects, rel. to neutron irradiat. 3=22766
- lattice focusing of collision sequences 3=22881
- magnetoelectric effects in fields up to 180 kOe, at 4.2°K 3=4909
- mechanical strength, tensile, n-irradiated, increase on annealing 3=20730
- moving edge dislocations 3=10654
- neutron induced lattice defects rel. to resistivity 3=22769
- radiation damage recovery 3=8470
- scattering, of Rb⁺ and Cs⁺ ions 3=2047
- scattering process of Rb⁺ and Cs⁺ ions 3=22854
- secondary electron emission by Ar atoms and ions 3=9842
- self-diffusion in single and polycryst. 3=17787
- sintering grain size reduction on adding Si 3=20921
- specific heat, 1200°-2400°K 3=10596
- sputtering by Ne⁺, Ar⁺, Kr⁺, Xe⁺ ions, 100-1000 eV 3=4216
- subgrain boundaries, structure 3=20212
- superconducting, critical mag. fields 3=3959
- superconducting, energy gap and critical field, by u.s. meas. 3=3958
- superconductivity, isotopic mass effect 3=7404
- tensile props., zone-refined Mo 3=1236
- thermal conductivity, phonon and electron components, separation methods 3=12930
- thermal conductivity, up to 1700°K 3=14395
- vacancy annihilation on neutron irradiat. 3=2787
- vaporization, heat of, at 298°K 3=1876
- welding 3=18685
- X-ray Fourier anal. and line breadth meas. 3=16068
- yield stress parameters det. 3=6782

Molybdenum compounds

- molybdates, luminescence 3=20508
- molybdenite, ion-bombardment effects 3=22851
- Mo(Al, P)₃, lattice parameters 3=25725
- MoB, crystal structure, rel. to similar types 3=18338
- Mo₂B₃, quadrupole bond, n.m.r. meas. and calc. 3=11121
- MoBe₂, crystal structure 3=20839
- MoC, thermionic emission, 1300°-1900°K 3=16974
- Mo₂C, crystal structure, by neutron diffraction 3=11264
- MoCl₃, crystal structure 3=13464
- Mo₈Cl₄⁴⁺, bonding 3=8281
- Mo-Fe, low temp. resistivity 3=13035
- Mo₃Ir, superconductivity, isotope effect 3=7404
- Mo oxide, whiskers, obs. 3=3374
- Mo trioxide and disulphide, fission fragment damage 3=20253
- MoO₃, fission fragment damage 3=22855
- MoOCl₃, liquid and supercooled soln., Mo⁹⁴,⁹⁵ e.p.r. 3=1711
- Mo Permalloy, use for mag. electron-microscope lenses 3=2037
- Mo-Re alloy, b.c.c., twinning dislocations 3=20191
- Mo-Re alloy "emissary" dislocations 3=793
- Mo-Re alloys, dislocations, direct obs. rel. to annealing and content, 3=22781
- Mo-Re, b.c.c., mag. suscept. and H-affinity 3=3084
- Mo-Re, supercond., anisotropy in mag. field 3=14452
- Mo-Re wires, supercond., critical currents 3=14454
- Mo-35 at.%Re, crystal twinning 3=23380
- MoS₃, displacement spikes, expt. evidence 3=4866
- MoS₃, rhombohedral, crystal structure 3=13459
- MoS₃, thermal cond., dielec. const. 3=8376
- MoS₃, thin crystals, optical props. and photocond. 3=10957
- Mo silicides, mechanism of heat conduction 3=25213

Molybdenum compounds — contd

- Mo-Tc system, superconducting phases 3=19113
- MoTe₃, optical properties of single crystals 3=25466
- Mo-Zr-C, phase boundaries rel. to composn. 3=23476

Monochromators

- See also Filters, optical; Light sources; X-ray monochromators.
- apparatus function half-width meas. 3=16781
- astigmatic image size, var. with wavelength, out to 600nm 3=14353
- constant energy, 550-1500 mμ, with dispersion control 3=3882
- high order isolation in grating spectra 3=7345
- interference, Fabry-Perot, spherical 2 m path difference 3=16797
- interference methods, rel. to length meas., review 3=2403
- large aperture, revolving frame, for photography 3=21553
- optical system, anastigmatic, for arc imaging 3=11920
- polychromator, for time-depend. line profiles 3=7346
- review, prismatic and grating, resolution 3=14352
- scattering reduction, by filters, Littrow 3=7344
- stray light meas. 3=14354
- u.v., far. grazing incidence, with concave grating 3=3881
- vacuum ultraviolet work, Cornell 3=10964
- vacuum u.v. 3=1819
- Zeiss prism; transmission, resolution, and stray light 3=254

Moon

- altitudes meas. by photography 3=9172
- bolometer, ferroelectric 3=16349
- centre-of-mass coordinates 3=1511
- centre-of-mass, precision detm. by photog. obs. 3=3545
- composition, theory. 3=25860
- convection currents, second-order, viscosity 3=5238
- crater, surrounding zones of plasticity 3=9171
- craters, relative ages, from albedo and polarization 3=11513
- e.m. emission, interpretation difficulties 3=21090
- earth-moon problem, plane restricted, periodic librations 3=7021
- earth-moon system evolution and paleomagnetism 3=9130
- effect on atmosphere, ice nucleus conc. 3=11399
- effect on meteor incoming rate 3=13777
- element abundances in crust 3=3546
- elliptic inequalities 3=13857
- Hansen's lunar theory, modification 3=13859
- illusion, 3=11628
- illusion of greater size at horizon 3=1570
- interior structure, from lunar tides 3=23670
- internal constitution 3=1514
- internal constitution 3=3547
- and ionosphere E's 3=21060
- and ionosphere, F₂ region, tide in f_oF₂ at low latitudes 3=16276
- luminescent radiation meas. 3=9148
- lunar craters, distribution and origin 3=11514
- magnetic field 3=5237
- maria, dimensional correl. with earth ocean basins 3=16332
- meteor impact and earth atmospheric ice nuclei 3=21038
- meteor impacts, frequency versus mass for stoney and Fe meteoroids 3=13874
- meteorite impacts, maria, earth ocean basins and lopoliths 3=11384
- orbital theory, von Zeipel method 3=13858
- origin by rotational fission during earth's core formation 3=13861
- origin in circumterrestrial satellite swarm 3=16330
- photometry, multi-colour programme 3=16340
- position meas. and time differences, ephemeris—universal 3=21093
- profile meas. in annular eclipse 3=9177
- radar reflections at 425 Mc/s 3=11596
- radiation properties at 3.2 cm 3=9264
- radio brightness distrib. at 0.8 cm 3=9266
- radio communication on surface 3=9174
- radio emission at 3.2 cm, polarization 3=9265
- radio scatt. behaviour, theory 3=9263
- radio wave scatt., theory 3=11587

Moon — contd

- rainfall correl. obs. 3=3462
 rel. to atmospheric ozone 3=13661
 rel. to geomagnetic disturbances 3=13840
 reverse side, principle features 3=9176
 reverse side, surface details, photometry 3=23672
 satellites, close, in equatorial plane 3=23671
 scattering behaviour, at 3.6, 68, 784 cms wave-length 3=11598
 seismograph 3=9168
 seismograph, lunar 3=5241
 spectrophotometry of selected surface areas 3=11511
 sputtering rates under solar-wind bombardment 3=23667
 statistical model of surface, rel. to radio echoes 3=1513
 Straight Wall, altitudes, photographic meas. 3=9173
 straight wall, topography and tectonics 3=23673
 surface and subsurface magnetic susceptibility instrumentation 3=13856
 surface, apparatus to analyse elements 3=21096
 surface composition detm. by α -ray backscattering 3=8991
 surface, corrugated model 3=9170
 surface, e.m. wave scatt. and statist. distrib. 3=1512
 surface features, anorogenic moulding theory 3=5239
 surface grid system, and S. Australian ring structures 3=16333
 surface material 3=16334
 surface meas., 8000-23000 Å 3=9167
 surface props. from thermal radiation 3=11510
 surface, r.m.s. slope, radar determination 3=11597
 surface, radioactivity analysis 3=21145
 surface roughness and crater statistics 3=9169
 surface roughness from crater statistics 3=21094-5
 surface structure and reverse side, review 3=9175
 surface thermal behaviour during lunation 3=16331
 synodical period correl. with precipitation 3=3461
 tektite origin theory 3=3561
 temperature, long-wave emission, errors in meas. 3=5240
 10μ radiation measurements 3=13903
 thermal cond., upper layers as solid not dust 3=11512
 three-body problem, librations near triangular point 3=11743
 tidal evolution of earth-moon system 3=21092
 Tycho crater, radar reflectivity enhancement 3=9267
 walled plain Ptolemaeus, craters diam. 3=21091
 X-ray emission, calc. and composition 3=13860

Mössbauer effect

- See also Gamma-rays, absorption; Nuclear excitation.
 analogue for optical transition of impurity centre 3=10648
 "clock paradox" expts., misconceptions 3=1587
 comparison with Shpol'skii effect, quasi-line 3=20077
 constant acceleration transducer for meas. of 3=5600
 in crystal, impurity nuclei 3=6461
 crystals, parameter calc. 3=2701
 cubic crystal, rel. to localized-mode detection 3=20056
 cubic harmonic lattice, semi-infinite, magnitude, nr surface 3=25171
 in degenerate systems 3=17286
 Doppler effect, transverse, meas. in accelerated system 3=9332
 elementary résumé 3=6144
 f-factor for impurity source in crystal 3=20058
 and ferroelectrics 3=8559
 in harmonic lattice, line shape of radiating atom 3=8345
 hyperfine field in metals and alloys 3=8342
 impurity atom in periodic host lattice 3=25168
 impurity nuclei at low temp., calc. 3=8339
 impurity nuclei in solid solns. 3=8337
 impurity nuclei, lattice dynamics model 3=4805
 impurity nuclei, temp. Green functions 3=25173
 impurity nucleus in crystal, one-quantum analysis 3=22627
 intensity and normal freq. of γ -ray scatterer 3=8338
 lattice defect investigation 3=22698
 for level splitting and displacement meas., review 3=19755
 line broadening of sources and absorbers, effect on resonance absorpt. 3=12567
 measurement, drive, loudspeaker, high velocity 3=19514
 metals, localized mag. moments meas. 3=12908
 quadrupole splitting, two peaks, difference 3=10570

Mössbauer effect — contd

- relativity, general, appls. 3=12565
 and relativity, general, Doppler effect for group motions 3=16513
 resonant fluorescence absorption, dispersion effects 3=10911
 resource letter, bibliog. and other teaching aids 3=6143
 review, Nobel prize address 3=4557
 review, popular 3=20066
 solids, effect of external perturbation 3=15414
 solids, review 3=25170
 in solids, use, h.f.s. explanations 3=20057
 spectrum shape, effect of crystalline fields 3=22626
 temperature shift, anharmonicity influence 3=20062
 theory, intermediate scatt. function 3=12682
 thermal broadening due to lattice vibr. 3=2697
 thin films 3=20060
 transmission and line broadening 3=12566
 Al, impurity nucleus, theory 3=20063
 Au^{197} , in Fe, Co and Ni, h.f.s. coupling 3=6458
 CuFe_2O_4 , cubic-tetragonal phase transform. 3=11205
 Eu, using Eu^{151} , h.f.s. meas. 3=17631
 Fe-Al alloys, rel. to mag. props. 3=15734
 Fe complexes, nuc. quadrupole interact. meas. 3=12905
 Fe cpds., Fe^{57} , for study of bonds 3=12894
 Fe^{57} , in biotite, meas. and theory 3=4802
 Fe^{57} in compounds and alloys, absorption line shift 3=2699
 Fe^{57} in ferrocene derivatives 3=15425
 Fe^{57} , 14 keV level, in various crystals 3=25174
 Fe^{57} , in Fe, metallic, 4-1300°K, internal field 3=6457
 Fe^{57} in Fe cpds., isomeric shift and quadrupole splitting 3=22629
 Fe^{57} , isomeric displacement rel. to chemical combination 3=7972
 Fe-Mn alloys, rel. to antiferromagnetism 3=15907
 Fe^{57} , in NaCl, CoCl_2 precipitated state 3=22630
 Fe^{57} , in NaCl, vacancy-impurity association 3=22631
 Fe-Ni alloys, mag. field meas. at Fe^{57} 3=25522
 Fe-nitrosyl complexes rel. to s-electron shielding 3=25125
 Fe^{57} in ordered Fe_3Al 3=8334
 Fe-Rh alloys, Fe^{57} hyperfine fields and isomer shifts 3=17632
 Fe-Rh system, hyperfine fields and mag. moments 3=15733
 Fe-Si alloys, internal mag. fields at Fe^{57} 3=8335
 Fe^{57} in $\text{FeSi}_{1.00}$, $\text{FeSi}_{1.05}$, $\text{FeSi}_{1.07}$, h.f.s. study 3=2698
 Fe_3Si , Fe_2Si_3 , mag. structure investigation 3=23180
 Fe silicates, meas. interpret. 3=8341
 Ge, impurity nucleus, theory 3=20063
 Hf^{177} , nuc. res. fluorescence of 113 keV level 3=12568
 I^{129} , Te and ZnTe sources and $\text{NaI}_2\text{H}_2\text{O}$ absorber, quadrupole splitting 3=2367
 I^{129} , 26.8 keV, in KI, KIO_3 , NH_4IO_3 3=19786
 Kr^{83} trapped in clathrate cpd. 3=4807
 and Ni, Mn, transformation, order-disorder 3=13528
 Sm^{149}O , 3=6459
 β -Sn crystals, anisotropy, 77°-293°K 3=2700
 Sn^{119} , in organic Sn cpds., quadrupole interaction and isomeric shifts 3=15415
 Sn-organic cpds., rel. to γ -irrad. 3=17633
 Sn-organic cpds, spectra peculiarities 3=744
 Sn, powder, asymmetry of doublet components 3=20059
 SnBr_2 , singlet spectra 3=8340
 $\text{Sn}(\text{C}_6\text{H}_5)_4$, singlet spectra 3=8340
 SnCl_4 , singlet spectra 3=8340
 $\text{Sn}^{119}\text{O}_2$, splitting of Mössbauer line by u.s. vibrations 3=15426
 SnO_2 , 23.8 keV γ -rays, rel. to temp. 3=22628
 SnO , singlet spectra 3=8340
 SnI_4 , singlet spectra 3=8340
 Te^{125} , in Te, α - TeO_2 , MnTe, CrTe, 35.3 keV γ -rays 3=25166
 Tl^{203} , n.r. fluor. line, Doppler-broadening 3=629
 Tm^{167} , 8.4 keV, nuclear h.f.s. in TmFe garnet 3=20061
 Tm^{169} in oxide crystals, h.f.s. splitting 3=2416
 Tm^{169} , in Tm, h.f.s. splitting 3=8006
 W isotopes 3=6462

Mössbauer effect — contd

- Xe¹²⁹F₂, Xe¹²⁹F₄, Na₂Xe¹²⁹O₆·H₂O, hydroquinine clathrate,
4.2°K 3=17634
60ZnFe₂O₄—40NiFe₂O₄ 3=8645
ZnO 3=6460

Multiple stars

See Stars.

Muonium

- electron depolarization mechanism 3=15418
bimuonium; formation and properties 3=2292
scattering on H₂ molec. vibration levels 3=2291

Musical

See Acoustics, musical.

Musical instruments

- bagpipes, acoustic spectra 3=23988
design, role of acoustics 3=16712
clarinet, acoustics 3=16713
clarinet, small-vib. theory 3=9562
organ flue pipes, Camerer's spirals. 3=215
organ, quality and warmth of tones 3=9563
violins, old and new, acoustic studies 3=14276
violin, use of circuit concepts 3=9564
woodwind, origins and acoustics. 3=216
woodwind, design and various types. 3=217
woodwinds, reson. frequency 3=18910

Nebulae

See also Galaxies.

- Crab, occultations by solar corona, June 1962 3=13936
Crab, radio polarization, 21 cm 3=23713
Crab, 1390 Mc/s radiation, linear polariz. 3=9277
dark, thin, investig. by star counts 3=3609
diffuse galactic, Taurus and Scorpius—Ophiuchius
regions 3=16422
diffusion of resonance radiation 3=9240
diffusion of resonance radiation 3=16403
gas dust, filament stability 3=23698
near η Carinae, effect on airglow spectra 3=6990
North America, 3727 Å O II radiation 3=9148
observations 1959-60, conference 3=9139
Omega, 9.1 cm obs. 3=9278
Orion, 9.1 cm obs. 3=9278
planetary, H distrib., e density, ionization, mass. 3=23697
planetary, high-excitation, thermal equil. 3=1536
planetary, ionization structure 3=21120-1
planetary, masses and forms. 3=3608
planetary, shape rel. to mag. fids. 3=3611
planetary, spectrophotometry 3=21122
planetary, optical thickness and central star temp. 3=9249
planetary, spiral and barred spiral electric discharge
theory 3=18645
planetary, Zanstra theory for condensations 3=9245
radio sources, polarization, 3 cm, search 3=18663
solar nebula, origin 3=9250
spectrum excitn. from u.v. star quanta absorpt. 3=3612

Neodymium

- atoms, h.f.s. by atomic beam magnetic resonance 3=4709
diffusion, anomalous, in Ag and Pb 3=13065
laser action of ions in silicate glass, simultaneous with
Yb ions 3=7737
laser, continuous-wave 3=22014
liquid, surface tension, 1030—1186°C 3=5425
photoelectric emission 3=5694
spectrum, visible, rel. to 4f shell transitions 3=13182
Nd³⁺ e.s.r. in CaF₂ 3=3172
Nd³⁺ glass, maser, optical, 1.06 μ 3=22008
Nd³⁺, i.r. absorption spectra in soln. 3=9462
Nd³⁺ in LaBr₃, absorption spectrum 3=3009

Neodymium compounds

- Nd-activated glass, as optical quantum generator,
flash spectrum, time variation 3=25444
NdAl₂, mag. moment and Curie pt. 3=991
NdCd₁₁, electronic configuration and dimensions 3=13237
Nd chloride, soln. in alcohol-water, temp.
depend. 3=21374
NdCl₃ in alcohol-water soln., absorption spectra,
-87°C 3=1691

Neodymium compounds — contd

- NdCl₃·6H₂O, spin-lattice relax. 1.1° to 4.2°K 3=3183
NdCl₃·6H₂O, 1.1-4.2°K, 2-2660 c/s 3=8719
Nd ditelluride, Hall effect 3=20340
Nd ethylsulphate, e.s.r. 3=8714
Nd ethylsulphate, mag. h.f.s. coupling of Pm
isotopes 3=12906
NdH (x = 2.02-2.75), ferromag. props., variation
with temp. 3=15744
NdI₃, molten, elec. cond. of Nd 3=21404
Nd—Mg double nitrate, reflection spectrum 3=23063
Nd₂NiO₄, antiferromagnetism 3=18107
Nd(NO₃)₃·6H₂O, far i.r. absorptn. at liquid He
temps. 3=3006
Nd₂O₃, specific heat and thermodyn. props. 3=20104
in SrF₂, absorption spectra, luminescence, 77°K, optical
maser 3=20482

Neon

- arc, elec. cold-cathode characteristics, at pulsed-current
loading 3=4077
arc, elec., low-pres., optical radiation phenom. 3=4078
arc, rel. to C cathode hybrid spots 3=4070
atom and Ne II, resonance lines 3=14355
atom—Ne⁺ collisions, electron capture and stripping 3=47
atoms, charge exchange with Xe²⁺, ⁴⁺ 3=5630
atoms, ionization by colls. with Xeⁿ⁺ 3=7426
atoms, two-electron transitions to autoionizing
states 3=19927
breakdown, electric, rel. to added Ar (0.01-0.3 %) 3=19221
breakdown, u.h.f., formative time-lags 3=7491
compressibility, quantum hard-sphere model 3=21434
density, 20 × 10⁶ atmospheres 3=21100
diffusion of Ne²²—Ne³⁰ in pure Ne, thermal 3=14203
discharge, d.c., in Ne—Hg vapour mixture 3=9734
discharge, elec., probe noise in various regions 3=14550
discharge, glow, anomalous, charge-exchange 3=19219
discharge, striations, fast-running, peculiar excita-
tion 3=19195
electric discharge, positive column constriction 3=14549
excitation in discharge positive column 3=24238
fast Ne⁰, ²⁺, ³⁺ colls with inert-gas atoms; slow-ion
production 3=366
gas flow, free-molecular, momentum transfer to metal
surfaces 3=5456
gas, ionized, rarefied, charge-carrier diffusion 3=16906
gas maser, optical output 3=525
glow discharge, effect of hollow cathode on striations 3=74
glow discharge, moving striations, effect of standing
stratification 3=9754
glow discharge, positive ion prodn. by Penning
mechanism 3=7474
glow, reference tube, rel. to Ar. Kr.Xe admixtures 3=405
He—Ne continuous laser, near i.r. props. 3=7317
He—Ne gas masers with external mirrors 3=9985
He/Ne laser, intensity, var. with pressure and relative
conc. 3=14805
He—Ne maser, optical, enhancement during after-
glow 3=14801
He—Ne, maser, optical new transitions, on dominance
removal 3=17090
He—Ne, maser, optical, power output, varying plasma
length and discharge current 3=17087
He—Ne planar laser, Zeeman effects 3=2145
ion beam, range in metals from sputtering yield 3=5721
ion beam on W, photon prod., 25-100 eV 3=21800
ion Ne³⁰, charge distrib. at high velocities 3=7447
ionization by h.f. pulse, recombination 3=4024
ionization by protons, 0.15-1.1 MeV 3=4006
ionization front velocity in column excited by u.h.f. at one
end 3=4037
ions, recomb., temp. var. 3=24222
ions, sputtering of KCl, 400 eV 3=4215
isotopic ratio, Ne²⁰/Ne²² 3=454
liquefaction, Linde, 66°K, 50-200 atm. 3=21640
liquid, thermal conductivity 3=18802
liquid, viscosity 3=21310
maser, optical, He—Ne, 3.39 μ 3=19495
maser, optical, oscills., ~1.8 μ , f-d transitions 3=14806
plasma, cold, negative radiation temperature 3=9787
plasma, radiation temperature resonances, r.f.
meas. 3=4121

Neon — contd

- powerful impulsive discharges, electron energy meas. 3=7452
production and use 3=16471
prod. from air decomposition plant 3=16472
spectra of Ne IV, V, VI in 2200-3000 Å 3=10459
spectra in highly ionized state, meas. 3=10448
spectrum, 1.15μ $2p_{1/2} \leftarrow 2s_{1/2}$ transition, isotope shift and saturation behaviour 3=19944
striation waves rel. to stimulated running striations 3=19191
viscosity and thermal cond. of mixtures with A and He. 3=168
viscosity meas., oscillating disc method 3=14189
NeI, excitation by H^+ and He^+ 3=12770
NeI spectral lines, precise meas. of separation 3=1814
Ne II line broadening in plasma 3=10454
NeII spark spectra in low-pressure plasma 3=7609
Ne⁺, bombard. of Cu and Ni (100) faces 3=13020
Ne⁺ sputtering of Cu, 5-20 keV 3=4217
Ne⁺ sputtering of Cu, Ni, Fe, Mo, 100-1000 eV 3=4216
Ne⁸⁺, 2³S state, 20-parameter calc. 3=2561
Ne-Ar discharge, pulsed microwave 3=14537
Ne-nD₂ liquid systems, phase separation 3=3801
Ne-pH₂, phase separation, 0.95-86% Ne, 24.56°K 3=23871
Ne-He maser, optical, saturation at 3.39μ 3=18497
Ne-He mixtures, laser effect transitions 3=22475
Ne-He gas maser, optical output 3=525
Ne-He 2s-2p transitions in laser 3=6358
Ne (73%)-He (27%), liquefaction, Linde, 66°K, 50-200 atm. 3=21640
Ne(78%)-He(22%), plasma, low-pressure, weakly ionized, electron mobility 3=14525
Ne-Hg mixtures, plasma props., meas. 3=14597
Ne-Kr, diffusion of Kr⁸⁸ 3=3822
Ne-methane, cosmic ray muons in, energy-loss-rate 3=24821
Neⁿ⁺-Xe, and Ne-Xeⁿ⁺ collisions, ionization 3=2583

Neon compounds

- HeNe⁺, emission spectrum? 3=12822

Neptunium

- structure rel. to anisotropic thermal expansion 3=10606
Np⁴⁺, Slater-modified Hartree-Fock calc. 3=12767

Neptunium compounds

- No entries this year

Neutrinos and antineutrinos

- absorption by nucleons, isotopic structure and interactions 3=4377
absorpt. in Coulomb field of nuclei 3=10086
ang. distrib., Brookhaven 1962, compatibility with weak interaction theory 3=19610
cosmic ray prod., in stars, e⁺ detect. method 3=22224
cosmic rays, primary, and early stages of universe and anti-matter regions 3=22224
cosmology, direction in time of neutrino travel 3=3534
density in universe, upper limit 3=1507
detection, > 100 GeV, from electron cascade, Cherenkov radio radiation, possibility 3=17242
detection in sun, by $\nu + Be^9$ reaction 3=19886
discovery and measurement, review 3=4365
 e^{\pm} prod., on nucleons, lower bound calc. 3=14952
e.m. interactions, rel. to weak interact. with electrons 3=10085
emission by stars, in late C-burning phases 3=13896
energy density and ν -N scattering cross-section 3=14953
four-component theory 3=10083
interactions, and existence of two kinds 3=10084
interactions, high energy, cosmic-ray flux use possibility 3=22253
interactions, intermediate boson prod., calc. 3=19609
interactions, $\nu + N \rightarrow N + e + \pi$, theory 3=595
known: properties, review, and astrophysical role 3=24686
Majorana theory of muon's neutrino 3=10082
and μ decay, non-zero rest mass effect 3=22158
 $\mu^- + He^3 \rightarrow H^3 + \nu$, mass, upper limit 3=4417
 μ prod., at great depth, detection possibility 3=19608
muonic, decay electron spectrum for finite mass 3=10135
neutrino differences for electron and muon association 3=4359
nuclear excitation by antineutrinos, low-energy, from reactor, possibilities 3=17244

Neutrinos and antineutrinos — contd

- pair emission by hot plasma, calc. 3=7824
pair production from photons 3=2232
particle mixture theory, assuming two kinds 3=7773
photon theory of Jordan 3=16724
photoneutrino emission in stars 3=23693
photoproduction on electrons and radn from stars 3=577
prod., high-energy from p-synchrotron, horn focussed, external target 3=17343
production in atmosphere 3=4493
production from $1-10^3$ GeV N-N interactions 3=4366
production of π and K-mesons at high energies 3=22163
production of vector bosons and muons 3=10070
Regge pole in high-energy reactions 3=22104
relativistic quantum theory 3=4327
scatt., by nucleons, high energy neutrinos, possibilities 3=17244
scattering by nucleons, search at 1 GeV 3=578
scattering on electrons, higher approximations 3=2241
scattering on nuclei, rel. to $\mu^+\mu^-$ and e^+e^- pair prodn. 3=7880
scatt. on nucleons in anomalous muon interact. model 3=5984
second neutrino and particle classifications 3=14871
second neutrino and Sakata scheme generalization 3=4363
single four-component neutrino theory 3=7823
spark chamber, CERN 3=24690
stellar emission, $\gamma + \gamma \rightarrow \gamma + \nu + \bar{\nu}$ process 3=24689
2 kinds, rel. to 6-dimensional manifold systematization 3=12437
two-neutrino theory, approx. symmetries 3=538
two-neutrino theory, rel. to fund. particle models 3=543
2 types, existence, theory 3=24687
universal degeneracy 3=3533
 $\nu + A \rightarrow \pi + \mu + A$, diffraction mechanism, in nucleus field 3=24688
 $\nu + n \rightarrow p + e^-$, mediation by Regge particles, theory 3=24608
 ν -N and $\bar{\nu}$ -N collisions, pion prod. 3=7825
 ν -N interaction, π -meson production 3=4429
 $\nu + p \rightarrow p + e^- + \pi^+$, theory 3=10148
 $\bar{\nu} + p \rightarrow p + e^+ + \pi^-$, theory 3=10148
 $\nu + Z \rightarrow \mu + \pi + Z$, in nuclear Coulomb field 3=2293
- Neutron diffraction**
Born approx., time formalism 3=6905
ferromag. metals, band-theoretical interpretation 3=25540
single crystal equipment with high refl. angle 3=7869
- Neutron diffraction crystallography**
See also Crystal structure, atomic.
alkali halides, inelastic scatt., structure factors 3=22643
apparatus, two-circle, at Rossendorf 3=20822
binary alloys, liquid-like, scattering data interpretation 3=11282
collimator, optimum dimensions, calc. 3=6831
crystals, with isolated impurity atoms, vibrational spectrum 3=25187
diffractometer 3=13433
diffractometer JAERI 3=6829
diffractometer, construction and operating characteristics 3=20819
diffractometer with automatic programming-control system 3=1280
diffractometers, single-crystal, automatic, review 3=8818
dynamical theory, recent developments 3=1301
gonimeter, 3-circle, geometric props. 3=18288
gonimeter, three-circle, uses 3=1277
goniostat, full circle, for diffr. intensity data 3=8822
lattice vibration detm. rel. to interatomic force consts. 3=749
magnetic inelastic scattering 3=1116
magnetic and molec. structures, recent progress 3=1289
multiple scatt., static approx. for diffraction pattern 3=6013
neutron monochromator using 111 reflection from Ge 3=23428
"null matrix" method 3=13585
pattern photography 3=1290
rare-earth metals, mag. props. 3=1107
research in Australia 3=3289
single crystal diffractometers, conference 3=14932

Neutron diffraction crystallography — contd

- spectrometer, double-axis, Cracow 3=1281
 spectrometers, resolution and luminosity 3=1279
 spinel-type solid solutions, scattering, rel. to composition and degree of inversion 3=20830
 BP, coherent Bragg scatt. 3=1312
 CdS, coherent Bragg scatt. 3=1312
 Cr, antiferromag. props. 3=1109
 Co mag. form factors, spin density distrib., Hartree-Fock calc. 3=1103
 Fe mag. form factors, spin density distrib., Hartree-Fock calc. 3=1103
 Fe-Ni alloys, mag. moments and degree of order 3=1106
 FeSn₂, antiferromagnetism 3=1111
 H atom location and thermal motion detm. 3=6832
 Li₂SO₄·H₂O, coherent Bragg scatt. 3=1312
 Mg, neutron coherent scattering length 3=25708
 Mn-Fe₂O₄, ferrite 3=1114
 NaCl, spin-orbit effect 3=18294
 Ni, crit. scattering 3=1117
 Ni mag. form factors, spin density distrib., Hartree-Fock calc. 3=1103
 NiO, magnetic form factor 3=1104
 Si, spin-orbit effect 3=18294
 UFe₂, ferromag. props. 3=1113
 V-Fe alloy, atomic magnetic moment detm. 3=1105
 V, spin-orbit effect 3=18294

Neutron diffraction examination of materials

- apparatus for study of solids, universal 3=20608
 Born approx., time formalism 3=6905
 crystals, imperfections, small clusters 3=13584
 franklinite, magnon dispersion 3=3127
 graphite, artificial, crystalline anisotropy 3=5101
 helical magnetic structures, scattering cross-section 3=18097
 liquids, H-bonded 3=5428
 magnetic disorder scattering, meas. technique 3=1101
 magnetic helical structure, scatt. of polarized neutrons, calc. 3=6718
 magnetic structures, slow neutron scatt., cross-sections and polarization 3=23182
 research in Australia 3=3289
 spin density wave states, possible detection 3=2772
 BiFeO₃, magnetic ordering, 20 and 600°C 3=5018
 β-CuZn, short-range order study 3=16105
 Co_{0.92}Fe_{0.08}, magnetic-nuclear neutron scattering amplitude 3=18099
 Co-Ni, mag. moments and degree of order 3=25539
 Cr, antiferromagnetic structure 3=23195
 Fe-Co alloys, mag. moment distrib. 3=18098
 Fe-Co, phase transformation, order-disorder 3=23478
 Fe_{0.47}Rh_{0.53}, mag. moments, localized 3=15856
 Fe_{0.998}S, diffraction investig. of magnetic and structural props. 3=1023
 HoCo₅, mag. structure 3=8682
 MgZn ferrite magnetic structure 3=23184
 MnV₂O₄, spinel, magnetic structure 3=5026
 MnYO₃, magnetic ordering of Mn³⁺ ions 3=20610
 Na, liquid, dynamics, vibrational modes 3=1675
 Na, liquid, f-sum rule, violation, 100, 200, 300°C 3=5429
 Pb, no mag. sub-lattice revealed 3=15913
 Pd,Mn, antiphase domain structure 3=6729
 YCo₅, mag. structure 3=8682
 Y₃Fe₅O₁₂, mag. structure 3=23186
 YNd garnet, magnetization curves and structure 3=23183

Neutron spectra

- deuteron disintegration on D, T, He⁴, at 9 MeV 3=2327
 epithermal, inside reactor, meas. method 3=25026
 evaporated from excited nucleus 3=7980
 in fission; energy and number rel. to fissioning nucleus props. 3=686
 in lattices, ang. thermal flux 3=12723
 μ⁻ + He⁴ → H³ + n + ν 3=14997
 (n, nα) in KI(Tl) and CsI(Tl), 12.1 to 21.5 MeV 3=2479
 π⁻ interacts. in emulsions 3=17312
 polarized neutrons, using mag. field 3=2269
 reactor, average, rel. to displacement damage 3=17517
 in reactor, meas. 3=19912
 in reactor, meas. with Au and S probes 3=25018

Neutron spectra — contd

- from reactor with modified split core 3=6334
 space depend., in heterogeneous reactors 3=8157
 Ag¹⁰⁷(γ, n), rel. to giant res. splitting 3=6230
 Al, fast neutron scatt. 3=6254
 Al(p, n), 143 MeV 3=10349
 Al²⁷(n, np), 14.8 MeV, by cpd. nucleus theory 3=17481
 Au, proton bombarded, 6-12 MeV 3=12669
 Be⁹(d, n)B¹⁰, 80 keV 3=2488
 Be⁹(He³, n)C¹¹, 2 MeV 3=19881
 C¹²(γ, n)C¹¹ 3=662
 C¹²(γ, n)C¹¹, using 30.5 MeV photons 3=4621
 Co(d, n) 3=24963
 Co⁵⁹(p, n), 6.5. MeV direct processes 3=12667
 Cu(d, n) 3=24963
 DD and DT reactions 3=2276
 D-H reactions meas. 3=6290
 D(p, n), 143 MeV 3=10349
 F¹⁹(p, n)Ne¹⁹, 5 to 11 MeV 3=17466
 Fe(d, n) 3=24963
 He⁴(γ, np)D² 3=6093
 In¹¹⁵(γ, n), rel. to giant res. splitting 3=6230
 Li(p, n), 143 MeV 3=10349
 Li⁷(p, n)Be⁷ 3=10346
 N¹⁴(γ, n), using 30.5 MeV photons 3=4622
 Ni(d, n) 3=24963
 Ni, proton bombarded, 6-12 MeV 3=12669
 O¹⁶(γ, n), giant res. up to 170 MeV 3=8076
 O¹⁶(γ, n)O¹⁵, pronounced structure 3=662
 O¹⁶(γ, n)O¹⁵, using 30.5 MeV photons 3=4621
 O¹⁶(γ, n), using 30.5 MeV photons 3=4622
 Pb²⁰⁸, inelastic scattering, up to 4.5 MeV 3=17477
 Po-α-Be source, meas. 3=17498
 Pu + Be source 3=15159
 Pu-Be source, meas. by time-of-flight method 3=10131
 Rh, proton bombarded, 6-12 MeV 3=12669
 Rh¹⁰³(γ, n), rel. to giant res. splitting 3=6230
 S³², photoneutrons 3=19832
 T(d, pn)T, virtual state of He⁴ 3=2331
 T-D reactions meas. 3=6290
 Ta, proton bombarded, 6-12 MeV 3=12669
 Ta¹⁸²(γ, n), rel. to giant res. splitting 3=6230
 Tb¹⁵⁹(γ, n), rel. to giant res. splitting 3=6230
 U-H₂O lattice 3=25029
 U-monoisopropylidiphenyl lattice 3=25029
 U²³⁵ fission neutrons 3=12715
 U²³⁵ fission by thermal neutrons 3=6311
 U²³⁵ slow fission, prompt neutrons 3=19893
 U²³⁸ fission, nuclear temp. det. 3=8104

Neutron spectrometers

- choppers, 2-rotors with flat slits, pulse shape and transmission function 3=19658
 collimators, rubber Soller slit 3=2281
 control system, programmed 3=24753
 depolarization, prevention 3=6014
 filter, variable thickness 3=17289
 geometrical consideration 3=20820
 linear electron accelerator, 30 MeV, for neutron prodn. 3=5727
 monochromator, single crystal, slow n 3=24748
 monochromators, with several disks and longit. rotational axis 3=19657
 neutron diffrn. research in Australia 3=3289
 nomogram for interconverting units 3=17291
 polarized beam, right and left-handed implications 3=18294
 proton-recoil proportional counter with γ-discrim. 3=4412
 use of reaction Li⁶(n, t)He⁴ above 150 keV 3=19656
 scintillation, for fast n, using coincidence 3=10130
 slow-neutron crystal type, for resonance scatt. expts. 3=601
 time analyser, msec multichannel 3=3984
 time-of-flight, fast discriminator 3=19145
 time-of-flight, improved 3=22395
 time-of-flight, 0.5 to 15 MeV 3=19655
 time-of-flight, pulsed source, use of microtron 3=22139
 time-of-flight, for use with tandem accel. 3=4413
 velocity selectors, phased choppers 3=4408
 Co-Fe crystals used, precision cutting 3=20821

Neutrons and antineutrons

See also Cosmic rays, neutrons; Nucleons and anti-nucleons.

- age in graphite, pulsed source method 3=2285
 asymmetry parameter, from μ^- capture by He^4 3=12460
 "bare", local V-A theory, radiative corrections 3=591
 beams, collimator surfaces for good definition 3=7867
 beams from Ge monochromator 3=23428
 beams, seminar and conference, London (1962) 3=10128
 beams, 10^{-3} –10eV, prod. and study 3=24741
 β -decay, radiative corrections 3=24735
 charge, expt. limits 3=10091
 chopper rotors, use of Mg–Cd alloy 3=8772
 cold storage in cavity with Be walls 3=7870
 decay, e^- - ν ang. correl., from recoil p spectrum 3=7861
 di-neutron, existence, from n–d scatt. 3=22137
 electromagnetic structure and e–d scatt. 3=5985
 form factors, from deuteron disintegration 3=17351
 form factors, from e–d scatt. 3=14959
 form factors, from e–d scatt. 3=19612
 form factor meas., electron–neutron coincidences 3=4397
 form factor, from scatt., e–d, e–p 3=14971
 form factors, rel. to deuteron
 electrodisintegration 3=2326
 14.6 MeV, incident on S^{32} 3=19862
 magnetic radius 3=2438
 mass difference, n–p 3=6009
 meson theory, strong-coupling, form factors 3=12449
 moisture meas. 3=7076
 multiplying assembly, probab. distrib. 3=10404
 n–p pairs, γ -ray absorpt. 3=15052
 neutron–neutron well logging theory 3=10118
 p–n mass difference 3=7840
 pairing correl. in nuclei 3=12542
 pairing energy in nucleus 3=10199
 pulses, monoenergetic, prod. by total refl. 3=4410
 radiative capture, mag. dipole matrix element 3=19710
 radiography technique 3=16475
 reactor asymmetric thin regions, net current 3=4683
 slowing-down of fission neutrons in BeO to 1.44
 and 0.3 eV 3=4404
 spin and charge states, generalized field theory 3=24603
 thermal spectra across lattice cells, calc. 3=2530
 Pb, crystal growth, large single, for neutron mono-
 chromatization 3=23403
 Zn, crystal growth, large single, for neutron mono-
 chromatization 3=23403

absorption

See also Nuclear excitation; Nuclear reactions, neutrons.

- capture in crystals, correlation functions 3=20068
 cross-sections for various elements, pile oscillator
 meas. 3=24946
 Doppler broadening of cross-sections 3=10418
 Doppler broadening for Maxwellian gas 3=19649
 graphite–thorium moderators, resonance
 absorpt. 3=25028
 in nonmoderating assemblies 3=17287
 optical-model fringe absorption and neutron strength
 function, erratum 3=8113
 optimum conditions, rel. to Beer's law 3=24041
 rate meas. in reactor, probe effects 3=12726
 rel. to "negative states" of resulting nucleus 3=12571
 resonance absorption, in lumps with nonunif. temp.
 distrib. 3=6323
 resonance, calc., lack of temp. effect 3=22147
 in slab lattices, epithermal flux 3=15254
 slowing-down in water, rel. to inelastic scattering in
 U 3=2275
 surface absorpt. on nucleus, S-wave strength
 function 3=2349
 thermalization in lattices, characterization 3=2527
 water, slowing down time scale 3=22148
 Ag–In–Cd control rod in pressurized water reactors 3=6336
 Au foils, self-shielding coeff. 3=4407
 by Cd plates in aqueous medium, Po–Be and Ra–Be
 sources 3=4405
 Er^{167} , Doppler broadening for low-lying reson-
 ances 3=19649
 in H slabs 3=22456

Neutrons and antineutrons — contd**absorption — contd**

- by In plates in aqueous medium, Po–Be and Ra–Be
 sources 3=4405
 Nb, resonance integral meas. 3=17484
 Pd^{109} , 1.5–10 eV, and energy levels 3=19859
 Th, effective reson. integral, reactor meas. 3=2544
 U, effective reson. integral, reactor meas. 3=2544
 U^{235} , capture cross-section, 0.02–2 eV 3=6258
 U^{238} , capture 3=10419
 U^{238} , resonance parameters of neutron cross-
 section 3=10357
 Xe^{135} , Doppler broadening for low-lying reson-
 ances 3=19649

angular distribution

- deuteron disintegration on D, T, He^4 , at 9 MeV 3=2327
 (n, $n'\gamma$), by coincidences, $n'\gamma$ 3=19870
 (n, 2n) reactions at 14 MeV, ang. correl. 3=24950
 n–p scatt., 200 MeV 3=7866
 thermal neutrons in lattice 3=12723
 Al^{27} scatt., 2.76 MeV 3=15207
 $\text{Al}^{27}(\text{t}, \text{n})$ 3=4673
 $\text{B}^{11}(\text{d}, \text{n})\text{C}^{12}$ and B^{11} –d breakup reactions 3=8126
 $\text{B}^{11}(\text{d}, \text{n})\text{C}^{12*}(\gamma\text{--n})$ ang. correl. 3=15226
 $\text{B}^{11}(\text{d}, \text{n}_{\gamma 1 \pm 11, 1 \text{ MeV}})\text{C}^{12}$, n– γ correl. 3=24967
 $\text{Be}^9(\alpha, \text{n})\text{C}^{12}$, 17.5–22.1 MeV 3=10388
 $\text{Be}^9(\text{d}, \text{n})\text{B}^{10}$ 3=24860
 $\text{Be}^9(\text{He}^3, \text{n})\text{C}^{11}$, 2 MeV 3=19881
 $\text{Be}^9(\text{p}, \text{n})\text{B}^9$, for 2.4–4.1 MeV protons 3=6243
 Bi, elastic scatt. at 15.2 MeV 3=2467
 $\text{C}^{12}(\alpha, \text{n})\text{O}^{15}$, 17.5–22.1 MeV 3=10388
 $\text{C}^{12}(\text{d}, \text{n})\text{N}^{13}$ 3=10376
 C^{12} , inelastic scatt. 14 MeV 3=15206
 C^{12} scattering polarization 3=19857
 $\text{C}^{12}(\text{t}, \text{n})$, at 0.35–2.4 MeV 3=4672
 $\text{C}^{13}(\text{d}, \text{n})\text{N}^{14}$, 3.2–4.1 MeV 3=24970
 Ca, elastic scatt., 3–4 MeV 3=19856
 $\text{F}^{19}(\text{d}, \text{n})\text{Ne}^{20}$, 1.0–1.3 MeV 3=6288
 $\text{F}^{19}(\text{t}, \text{n})$ 3=4673
 He^4 , scatt., 1.79 MeV 3=17281
 $\text{Li}^6(\text{d}, \text{n})\text{Be}^7$, ground and 1st excited state 3=15225
 $\text{Li}^7(\text{p}, \text{n})\text{Be}^7$, 4.3 MeV, polarized neutrons 3=8089
 $\text{Li}^7(\text{p}, \text{n})\text{Be}^7$, polariz., $E_p = 4.5$ MeV 3=17462
 $\text{N}^{14}(\text{d}, \text{n})\text{O}^{15}$ stripping reaction 3=2486
 $\text{Ne}^{20}(\text{d}, \text{n})\text{Na}^{21}$, n– γ ang. correl. 3=10377
 Ni, 900 keV, elastic scatt. 3=2463
 O, 900 keV, elastic scatt. 3=2463
 $\text{O}^{16}(\gamma, \text{n})$, giant res. to 170 MeV 3=8076
 Si, 900 keV, elastic scatt. 3=2463
 Ta, elastic scatt. at 15.2 MeV 3=2467
 Th, elastic scatt. at 15.2 MeV 3=2467
 U, elastic scatt. at 15.2 MeV 3=2467
 U^{235} , in fission by thermal neutrons 3=6311
 U^{235} slow fission, prompt neutrons 3=19893

capture

See Nuclear reactions, neutrons.

detection, measurement

See also Dosimetry; Neutron spectrometers.

- atmospheric cosmic rays 3=22222
 beam, energy distrib. meas. using activ. detectors 3=4406
 chopper mech., suspended in mag. field 3=2279
 counter, corona 3=24546
 counters, cylindrical, efficiency, thermal 3=24747
 counters, proportional, glass, BF_3 , thermal 3=24746
 in diffusion cloud chamber 3=19654
 dosimeter, for fast n, Si rectifier, $\text{n}^+ \text{--p}^+$,
 diffused 3=24816
 dosimeter, slow and fast, by selective fission fragment
 track registration 3=24752
 dosimeters, existing and proposed 3=17292
 dosimetry, current methods 3=2282
 dosimetry, new emulsion with increased gelatine 3=24569
 fast flux meas. in reactor 3=10430
 fast flux meas. in zero-energy reactor 3=22149
 fission chamber, small diameter 3=24540
 fission chamber, small, U coated W wire in Ar at
 15 atm. 3=17098
 flux in boiling-water reactor, high-energy 3=6331
 flux, $\text{In}(\text{NO}_3)_3$ solution foils, non-perturbing 3=17290
 flux meas., Dy detectors 3=2283

Neutrons and antineutrons — contd**detection, measurement — contd**

- by foils, flux perturbation 3=22150
- by foils, resonance activation 3=19653
- glass scintillator, discrimination against γ -ray back-ground 3=10132
- glass scintillators, B- and Li-containing 3=2277
- intermediate energy, scintillation counter 3=17293
- ionization-chamber detector of 0.3 eV resonance neutrons 3=2280
- ionization chamber, H—Ne, for 2-3 MeV 3=24750
- ionization chamber, hexane 3=19505
- in ionization chambers, liquid-hexane filled 3=19650
- n^4 search, in fission reactions 3=22136
- neutron identification circuit for scintillation studies 3=14489
- organic liquid scintillators, efficiency det. 3=2278
- organic phosphors as neutron detectors 3=4411
- photoneutron multiplicity meas. 3=10330
- reactor in-core flux meas., semicond. counter 3=22452
- refractometer, gravity, for scattering cross-sect. meas. 3=6018
- scintillation detector for fast neutrons 3=14990
- scintillation discs, pressure prep. 3=22151
- scintillators, organic, discrimination against γ 's 3=14991
- spectrometer, time-of-flight 3=589
- thermal flux standard, calibration 3=19651
- B-loaded liquid scintillator, single photomultiplier 3=4409
- BF₃ counter, energy dependence of sensitivity 3=24539
- BF₃ counter in paraffin sphere, ang. response 3=24749
- by Bi, D—T neutrons, time-of-flight expt. 3=6011
- by C, D—T neutrons, time-of-flight expt. 3=6011
- P—polythene mixture, fast neutron meas. 3=2284
- S³²(n,p)P³², as fast-neutron monitor, 2-20 MeV 3=12687
- Si junction, neutrons from DD and DT reactions 3=2276
- U²³⁵ fission chamber, B¹⁰ shielded 3=690
- U²³⁸ foils, bare and Cd-covered, activation 3=8166

diffusion

- absorber rods, symm. distrib., effectiveness 3=6015
- anisotropy in singly and doubly periodic lattices 3=6324
- Boltzmann eqn., monoenergetic, variational analysis 3=18755-6
- Boltzmann transport eqn., Carlson discrete S_N approx. 3=22144
- calc., iterations number reduction, EQUIPOISE-3 programme 3=10123
- cosmic-ray C¹⁴ prod. by neutrons, theory 3=17378
- cylinders, flux distrib., variational method 3=4402
- in diphenyl, pulse method 3=2271
- flux at a point, Monte Carlo estimation 3=24739
- flux peaking at sharp corner 3=15255
- group diffusion eqns. for infinite reflector 3=19901
- heavy water, transport eqn. soln. 3=2272
- n-heptane, thermal neutrons 3=22143
- heterogeneous reactor, cylindrical fuel elements 3=10416
- ice, 0°C 3=6017
- ice, 0°—-80°C meas. 3=4401
- linear extrapolation distance, improvements on Milne solution 3=22449
- in monoisopropylidiphenyl, pulse method 3=2271
- multigroup, P₁ approx., general eqns. 3=2273
- "non-separable" multiplying systems, iteration 3=10122
- one group theory rel. to Yankee startup expt. data 3=2520
- in paraffin, temp. depend. 3=19648
- in polyethylene, temp. depend. 3=19648
- slowing-down in sphere, P_∞ point-source soln. 3=24740
- in solid, finite, thermal, Bragg cutoff effect 3=10124
- space—energy separability in pulsed systems 3=14989
- thermal flux in moderator of supercell 3=8158
- thermal, in media of nonuniform temp. 3=14988
- thermal neutrons in moderators, meas. 3=10125
- thermalization operator, generalized Horowitz 3=22142
- transport eqn., effect of scatt. and cross-section 3=19647
- transport in infinite homog. media, eqn. soln. 3=2272
- transport theory, energy-dependent, constant cross-sections 3=15258
- transport theory, energy-dependent, integral eqn. 3=588
- two-group eqns. soln., analytic method 3=6325
- in water, diffusion hardening det. 3=6016

Neutrons and antineutrons — contd**diffusion — contd**

- water, 0°, 20°C 3=6017
 - water, 0°—-80°C, rel. to molecular rotation 3=4401
 - Yvon approx. method 3=22146
 - Al—water mixture, transport eqn. soln. 3=2272
 - Be, 100°K, thermal, corrections 3=10124
 - in D₂O, thermal neutrons, 20°-220°C 3=2270
 - Fe—Al—water mixture, transport eqn. soln. 3=2272
 - H₂O, poisoned, var. with poisoning, Cd, B 3=22141
- effects**
- See also Nuclear reactions, neutrons.
 - alloys, non-fissionable, vacancies, point defects, atomic displacement 3=10702
 - cold beams, uses, review 3=24745
 - diamond, abrasion hardness 3=3248
 - diamond, colour changes 3=20252
 - graphite, annealing, e.s.r. study 3=22867
 - graphite, dimensional changes 3=25309
 - graphite, displacement spikes 3=17703
 - graphite, interstitial annealing and displaced-atom formation 3=788
 - graphite, low temp. electromag. props. 3=8485
 - graphite, microstructural changes 3=25651
 - on graphite, paramag. reson. and relax., single crystals 3=13296
 - graphite, thermal expansion 3=2737
 - irradiation behaviour of graphite 3=25027
 - metals, dislocation loop size 3=2802
 - metals, f.c.c., rel. to mechanical properties 3=8467
 - metals, f.c.c., creep, rel. to vacancy distrib. 3=1228
 - metals, mechanical damage, theory 3=4897
 - metals, pure, damage rel. to flux energy 3=2847
 - metals, review 3=4895
 - metals, transient irradiation creep 3=20717
 - phosphates, thermal and radiation annealing 3=22872
 - polymeric dielectrics, electrical conductivity, 14 MeV 3=20378
 - polymers, dynamic proton polariz. meas. 3=10114
 - quartz, crystal deformations and colour centre dipole losses 3=20157
 - quartz, dielectric const. and refractive index 3=17929
 - quartz, interstitial cluster formation 3=10647
 - quartz, lattice defects 3=22765
 - quartz spin—lattice relaxation, rel. to neutron-irrad. 3=18136
 - α -quartz, Raman scatt. 3=3026
 - reactor shielding damage, dosimeter meas. 3=10423
 - semiconductor detector resolution, Si junction 3=22044
 - semiconductors, correl. with proton damage 3=25308
 - semiconductors, elec. props. and damage, review 3=25335
 - semiconductors, inhomogeneities 3=22909
 - strain rate, Nabarro effect 3=13018
 - thermocouples and metal resist. thermometers 3=3915
 - transition metals, embrittlement, rel. to neutron irradi. 3=8784
 - ultrasonic cavitation 3=17132
 - Ag films, for various substrates and atmospheres 3=2280
 - Al, damage, effect of plastic deformation, 1.8°K 3=6554
 - Al, defect structures 3=17735
 - Al, dislocation damping 3=4868
 - Au, from electron microscope spot size and density 3=890
 - Au, stage II and III recovery 3=2848
 - Au—0.25 at.% Hg, stage II and III recovery 3=2848
 - BaTiO₃, ceramics, ferroelec. props. 3=893
 - BeO, defects 3=20255
 - BeO, irradiated, He diffusion after annealing, from specific heat, below 4°K 3=15509
 - BeO, structural changes 3=18298
 - BeO, vacancy and interstitial defect formation 3=8426
 - CClF₃, u.s. cavitation 3=14122
 - CH₄—D₂ mixtures, failure of T elastic collision model 3=18460
 - CaO, optical and e.s.r. spectra 3=13169
 - Cd, pure, by thermal neutrons 3=2847
 - CdS, elec. and photoelec. props. 3=4917
 - Cs₂Sb, film, photoelectric emission 3=14632
 - Cu crystals, on flow stress 3=20719
 - Cu crystals, hardening mechanism, 0°C 3=20721

Neutrons and antineutrons — contd**effects — contd**

- Cu, damage, effect of plastic deformation, 1·8°K 3=6554
 Cu, rel. to dislocation etch pit study 3=22788
 Cu, elastic modulus and damping capacity 3=5059
 Cu films, for various substrates and atmospheres 3=22869
 Cu, from electron microscope spot size and density 3=8939
 Cu glide dislocations, rel. to irradi.-produced prismatic dislocations 3=17760
 Cu, hardening 3=23340
 Cu, loop size distrib., measure and model 3=17722
 Cu, primary atom energy distributions, rel. to fast neutron irradi. 3=8431
 Cu, pure, by fast neutrons 3=2847
 Cu—Ni wires, resistivity 3=10719
 Cu₂O, rel. to exciton spectra 3=17998
 D₂—CH₄ mixtures, failure of T elastic collision model 3=18460
 Fe, α -phase, slip bands, obs. 3=809
 Fe, doped, resistivity when irradi. at 78°K 3=13034
 Fe, mag. props., very pure 3=23179
 Fe, magnetic "drag band" 3=8469
 Fe, point defects 3=17702
 Fe, pure, mechanical properties, 4° to 300°K 3=8759
 Fe whiskers, torsional plasticity 3=8763
 α -Fe, electron microscopic obs. 3=8477
 Fe—C, defect production, rel. to C precipitation 3=22866
 Ge, damage, direct observation 3=6553
 Ge, electron—hole pairs, recombination processes 3=2884
 Ge, thermal conductivity 3=17674
 Ge, thermoelec. and elec. behaviour 3=10898
 Ge, tunnel (Esaki) diodes, radiation defects 3=17918
 In films, dimeric : monomeric ionic current ratio of vapour, 773°–1373°K 3=19179
 K₂CrO₄, effects of crystal defects 3=22871
 K₂CrO₄, thermal neutron capture, compression annealing 3=25311
 K₂Sb, film, photoelectric emission 3=14632
 Li₂CrO₄, thermal defect annealing kinetics 3=17700
 LiF, defect growth 3=22868
 LiF, elec. cond., effect of irradiation temp. 3=2946
 LiF, elec. cond. 3=22981
 LiF, lattice defects 3=22702
 LiF, -195° to 100°C 3=22870
 LiF, X-ray patterns, unusual effects 3=20948
 Li salts, T release, thermal 3=23552
 MgO, damage, brittleness and dislocations 3=25310
 MgO, dislocation behaviour and yield stress 3=18185
 MgO, F- centres, spin—lattice relaxation 3=817
 MgO, slip bands and microhardness 3=17761
 MgO, sorption of O₂, H₂, N₂O 3=13604
 Mo, hardening, rel. to grain boundaries 3=4881
 Mo, irradi. damage and resistivity 3=22769
 Mo, lattice defects 3=22766
 Mo, vacancy annihilation 3=2787
 NO₂ prodn. in liquid N₂ and O₂, 14·6 MeV 3=8976
 NaBrO₃, thermal decomposition 3=6911
 NaCl, vacancies, direct meas. 3=8427
 (Na₂K)Sb, (Na₂K)CsSb, film, photoelectric emission 3=14632
 Nb, irradi. damage and resistivity 3=22769
 Ni films, for various substrates and atmospheres 3=22869
 Ni, point defect clustering 3=22721
 Ni ammonium salts, thermal recovery 3=8472
 NiO, chemisorption of O₂ and H₂ 3=3366
 NiO, sorption of O₂, H₂, N₂O 3=13604
 O₂ adsorption in NiO 3=13567
 Pb, supercond., crit. field 3=14451
 PbZrO₃, ferroelec. props. 3=13118
 Pt, Fe, thermal spikes, size meas. 3=22853
 Si, carrier lifetime 3=22933
 Si, carrier removal rate, rel. to neutron irradi. 3=17517
 Si counter diodes, recoil spectra of Si 3=25307
 Si, defects 3=22725
 Si, e.s.r. study of centres prod. 3=2849
 Si, effect on elec. resistivity of thermal-neutron bomb. 3=6589
 Si, n- and p-type, i.r. absorption 3=3018
 Si, phonon absorption bands 3=23044

Neutrons and antineutrons — contd**effects — contd**

- Si semiconducting junctions, p—n, max. allowable 3=22959
 Si, tracks, by electron microscopy 3=15524
 Si, tunnel (Esaki) diodes, radiation defects 3=17918
 SiO₂ glass, effect on elastic moduli and u.s. attenuation 3=13330
 SiO₂ glass, structural defect elimination by fast neutrons 3=767
 SiO₂, vitreous, dilatations and internal stresses 3=4899
 U, anisotropic growth, X-ray diffr. study 3=4898
 U, growth rate eval. 3=6310
 U²³⁸ fission, by 14 MeV neutrons 3=8143
 U²³⁸, γ from capture 3=4647
 UO₂, microstructural changes 3=20958
 UO₂, paramag. susceptibility 3=15758
 ZnS, luminescence quenching 3=4987
 ZnS, luminescence, quenching by Cu or Co 3=18039
 Zr—Nb, tensile and impact props. 3=1234
- interactions**
- capture by protons and deuterons 3=14987
 collision density at epithermal energies 3=12525
 deuteron breakup, 14·4 MeV 3=17350
 flux perturb. due to In foils in water 3=12461
 $\gamma + n \rightarrow p + \pi^-$, proton polarization 3=10115
 $n + d \rightarrow 2n + p$, field-theoretical model 3=19619
 $n + n \rightarrow \Lambda + n$, as a weak interaction 3=6085
 $n-p$, form factors for axial vector current 3=7862
 $n-p$, inelastic, 9 BeV 3=5997
 $n-p$, in pair correl. model 3=6003
 $\nu + n \rightarrow p + e^-$, mediation by Regge particles, theory 3=24608
 optical devices for beam hole expts. 3=22145
 photons, pion prod., integral eqns. 3=4422
 $\pi-N$, rel. to bootstrap mechanisms 3=24613
 $\pi^- + n \rightarrow \pi^- + \pi^- + \pi^0 + p$, 2·8 BeV/c 3=22175
 $\pi^- + n \rightarrow Y_2^* + K$, Y₂^{*} search 3=17349
 proton, mag. dipole interact. in deuteron 3=4398
 He⁴, 20–29 MeV, and He⁶ states 3=15099
 N—N, resonance model, pion theory 3=19621
- moderation**
- beams, pulsed, from particle accelerators 3=22138
 diffusion parameters for thermal neutrons, meas. 3=10125
 fuel element, thermal neutron spectrum 3=10408
 n-heptane, thermal neutrons 3=22143
 neutron temp., CANDU-type power reactor 3=25030
 in paraffin, temp. depend. 3=19648
 in polyethylene, temp. depend. 3=19648
 by polyethylene, thermal energies 3=19908
 pulsed neutron experiments, theory 3=25004
 reactor lattice, thermalization 3=10410
 reflected from a homogeneous half space, spectrum 3=7866
 renewal theory 3=10127
 slowing-down in sphere, P_∞ point-source soln. 3=24740
 slowing-down spectrum, CANDU-type reactor 3=25031
 temperature distrib. of neutrons in cylinder of hot moderator 3=25001
 thermal column of an exponential experiment 3=15253
 thermal flux in moderator of supercell 3=8158
 thermal neutron spectrum, integral eqn. 3=12721
 thermalization operator, generalized Horowitz 3=22142
 thermalization, time decay consts. 3=8167
 time-dependent neutron thermalization problem 3=24738
 transfer cross-section between overlapping thermal groups 3=8168
 vel. depend. transport with high-energy sources 3=10126
 water, attenuation functions, from isotropic and unidirectional fission sources 3=2274
 in water, fast fission 3=7865
 Cd₂Ta₂O₇, use as reactor control material 3=4699
- polarization**
- beams, 10⁻³–10eV, prod. and study 3=24741
 collimators, reflecting, multi-channel 3=22140
 $d + \gamma$ (12–30 MeV), and mesonic effects? 3=12513
 deuteron photodisintegration, meas. 3=15044
 energy spectrum, polarized neutrons, using mag. field 3=2269
 helical magnetic structures, after scattering 3=18097
 magnetic crystals, elastic scatt. 3=15861

Neutrons and antineutrons — contd

polarization — contd

- meas. by diffusion cloud chamber 3=19654
- measurement 3=6014
- measurement, by scatt. asymmetry, corrections for
 - finite geometry and energy 3=19646
- in n-d scatt., 1.0 MeV 3=19637
- n-d scatt., 1 MeV, elastic 3=12680
- n-d scatt., 1.9-23.7 MeV 3=19645
- n-d scattering at 0.5-1.95 MeV 3=587
- noncollinear spin densities, distinguish from
 - collinear 3=19643
- nuclear scatt., cpd. nucleus and direct contribs. 3=2471
- nuclear scatt., elastic, near 1 MeV, optical model 3=4644
- scatt. by C, 1 MeV elastic 3=12680
- scatt. by O, 1 MeV, elastic 3=12680
- scattering in ferromagnetic and antiferromagnetic
 - substances 3=3121
- scattering with protons at 23.1 MeV 3=10121
- Al, elastic scatt. at 24 MeV 3=6255
- Al(p,n), 143 MeV 3=10349
- Ar < 65, scattering, 3.5 MeV 3=2470
- Be⁹(γ,n)Be⁸, mag. dipole transition effects 3=22364
- Be⁹(p,n)B⁸, 3.7-8.5 MeV 3=19848
- Bi, elastic scatt. at 24 MeV 3=6255
- C, elastic scatt. at 24 MeV 3=6255
- C¹²(d,n)N¹³ 3=4666
- C¹²(d,n)N¹³, 6.5 MeV 3=22417
- C¹² scattering ang. distrib. 3=19857
- Co(d,n) 3=24963
- by Co films, mag. props. and structure, atomic, var. with
 - electrolysis conditions 3=23509
- by Co-Fe crystals, precision cutting 3=20821
- Cu(d,n) 3=24963
- by Cu, scatt. of 3.4 MeV neutrons 3=22392
- D(d,n)He³ 3=24807
- D(p,n), 143 MeV 3=10349
- Fe(d,n) 3=24963
- Fe, elastic scatt. at 24 MeV 3=6255
- Li(p,n), 143 MeV 3=10349
- Li⁷(p,n)Be⁷, ang. distrib., E_p = 4.5 MeV 3=17462
- Li⁷(p,n)Be⁷, 4-3 MeV 3=8089
- Ni(d,n) 3=24963
- by O¹⁶, scatt. of 2.5-3.2 MeV neutrons 3=22393
- Pb, elastic scatt. at 24 MeV 3=6255
- Sn, elastic scatt. at 24 MeV 3=6255
- from T (d,n) He⁴ 3=676
- V crystals, scattering 3=18057
- by Zr, scatt. of 3.4 MeV neutrons 3=22392

production

- α,n, mixture of light and heavy (α emitting) nuclei giving
 - spherical n source, calc. 3=22429
- beams with special properties, survey 3=24744
- cold neutron sources, review 3=24745
- d.c. neutron source, 10⁸ neutrons/sec 3=9868
- from deuterium, mechanism 3=10349
- fission neutrons, no. from mass distrib. curves 3=12714
- 14 MeV generator using H³(d,n)He⁴ 3=19386
- 14 MeV, sealed-off source, self-calibrating 3=10129
- generator, 14 and 2.5 MeV 3=2286
- generator, low-voltage, flux 10¹¹ sec⁻¹ at 14 MeV 3=24743
- heavy ion reactions, n evaporation 3=17499
- neutrons and precursors in multiplying medium,
 - probability distrib. 3=25002
- by nuclear reactor, fission, beams, intense 3=22450
- particle accelerators, pulsed, moderator effects 3=22138
- π⁻ absorpt. in nuclei 3=10372
- pulsed, very rapid, fast, l.p. h.t. discharge in d 3=19659
- source, using H¹(t,n)He³, as neutron source 3=24742
- target-rotation device 3=4414
- Θ pinch, without reversed trapped field 3=4144
- Al(γ,n), cross-section 3=6223
- Al²⁷(t,n) 3=4672
- C¹²(t,n), at 0.35-2.4 MeV 3=4672
- Cf²⁵², spontaneous fission, neutron production
 - rate 3=24988
- by D-D reactions, different targets 3=19562
- F¹⁹(t,n) 3=4672
- In¹⁵⁰(γ,n) neutron yield energy and angular
 - distrib. 3=15175

Neutrons and antineutrons — contd

production — contd

- Li⁷(p,n), background neutron scatt. from Ta backing of
 - target 3=2472
- O(γ,n), cross-section 3=6223
- P³¹, photoneutron energy spectrum 3=6220
- Po-α-Be source, energy distrib. meas. 3=17498
- Po-Li source, search for n-γ coincidences 3=590
- Pu + Be source 3=15159
- Pu-Be source, spectrum, meas., by time-of-flight
 - method 3=10131
- U²³⁵ fission fragments, neutron emission 3=12713
- U²³⁵, symmetrical fission 3=8151

reflection

- collimators, multi-channel, as filter and polarizer 3=221
- off Fermi liquid surface, slow neutrons 3=7863
- optical devices for beam hole expts. 3=22145
- in refractometer, total 3=6018
- solid solutions, effect of thermal oscillations 3=3339
- total, from collimator surfaces, suppression 3=7867
- total, prod. of monoenergetic pulses 3=4410

refraction

No entries this year

scattering

- α, 15 MeV, D-wave contrib. 3=19644
- ammonium salts, inelastic, cold neutrons 3=6010
- in antiferromagnetics, magneto-vibrational
 - theory 3=3149
- Born approx., time formalism 3=6905
- by collimator surfaces, reduction of net coherent scatt.
 - ampl. 3=7867
- by Coulomb field of nucleus, theory, electrodynamic
 - effects 3=15204
- cross-section detm. by gravity refractometer 3=6018
- cryostat (-130 to -190°C) for slow scattering expts. 3=738
- crystal, anharmonic Bravais, one-phonon process 3=4822
- crystal, coherent, including anharmonic terms 3=20042
- crystal lattices, exclusion of coherent scatt. 3=22642
- on crystals, inelast., rel. to phonon spectrum 3=6474
- crystals at low temp., resonance, Doppler effect 3=4801
- on deuterons, doublet scatt. length, zero-range
 - forces 3=24737
- by deuterons, neutron polarization 3=19645
- on deuterons, 0.5-1.95 MeV, polarization and diff. cross-
 - sections 3=587
- dimethyl acetylene, inelastic, cold neutrons 3=6010
- elastic, observed probabilities 3=17286
- ferrites, one-magnon, spin-spin interact.
 - effects 3=25541
- ferrites, one-quantum, spin-phonon
 - interaction 3=25542
- ferromag. crystals, dislocations invest. with polarized
 - neutrons 3=4871
- in ferromagnetic and antiferromagnetic subs. 3=3121
- in ferromagnetics, slow inelastic scattering 3=15857
- form factors, spin-wave, meas. possibilities 3=17288
- graphite (pyrolytic), lattice vibration study 3=2710
- heavy water, slow neutron scattering 3=9445-6
- inelastic, rel. to many-particle scatt. system 3=12462
- methanamide, mols. in liq. state 3=2652
- in Fermi liquid, slow neutrons 3=7863
- inelastic, from collective nuclear states 3=2465
- inelastic in condensed media rel. to boson
 - absorption 3=7828
- inelastic, cross-sections, optical model 3=19855
- inelastic, by "globular" organic cpds. 3=13393
- inelastic, solids and liquids, conference, Chalk River
 - (1962) 3=8326
- in imperfect crystals, diffusion effects, energy
 - broadening 3=4859
- lattice vibrations, theory and expt., review 3=22634
- liquids, collective motion model 3=7140
- liquids, quasi-scattering, theory 3=18797
- by mag. crystals, review of Soviet work since
 - 1958 3=1135
- magnetic crystals, polarization effects 3=15861
- magnetic helical structure, polarized neutrons,
 - calc. 3=6718
- magnetic solids, due to band electrons 3=986
- methane, liq., rel. to mol. rotation 3=14142

Neutrons and antineutrons — contd
scattering — contd

- molecules, appl. of classical self-correl. function 3=4732
 molecules, diatomic, quantum states
 transition 3=25074
 molecules, large energy transfer, theory 3=22516
 molecules, polar, hindered rotation 3=17284
 multiple scatt., static approx. for diffraction pattern 3=6013
 n- α , polarized, 2 to 24 MeV 3=19636
 n-d doublet scatt. length, upper bound 3=19638
 n-d, 1 MeV, elastic, polarization 3=12680
 n-d, 1.0 MeV, neutron polarization 3=19637
 n-d, three-body formalism 3=19641
 n-d, threshold effects due to di-neutron 3=22137
 n-n singlet scatt. length 3=19619
 (n,n), total cross-sections for light elements 3=10334
 near magic neutron numbers 82 and 126 3=22395
 noncollinear spin densities, distinguish from
 collinear 3=19643
 in nonmoderating assemblies 3=17287
 nonspherical nuclei, elastic scatt. 3=22396
 nuclei, compound nucleus and direct contribs. 3=2471
 nuclei, crystals and fluids, survey 3=20829
 on nuclei, inelastic, energy spectra, statistical
 model 3=2426
 nuclei, low-energy resonances, spin meas. 3=12684
 nuclei, polarization near 1 MeV, optical model 3=4644
 nuclei, rel. to level densities and reaction mech. 3=8107
 by o- and p-hydrogen mols., Schrödinger eqn. 3=4734
 by paramagnetic spin system 3=6695
 paramagnetics, spin-spin interaction 3=6694
 partial differential scatt. cross-sections, slow
 neutrons 3=17282-3
 π -N, s and p-wave, π - π contribution 3=2310
 polarization meas., by asymmetry, corrections for finite
 geometry and energy 3=19646
 by polyethylene, thermal energies 3=19908
 quasiclassical approx., Schofield time shift 3=4400
 quasi-elastic mag. scatt., gases or liquids 3=19642
 rare earth oxides 3=743
 by rare-earths, 1 MeV, elastic 3=12681
 renewal theory 3=10127
 scatt. chamber for resonance scatt. expts. 3=6012
 slow, Fermi approx., validity 3=19640
 slow, intermediate scatt. function analysis 3=12682
 slow, the "scatt. law" and $G(\vec{r}, t)$ 3=19639
 small angle, to study nuclear long-range potl. 3=15070
 in solids and liquids, Chalk River (Sept. 1962)
 symposium 3=6456
 spherical nuclei, near magic and isolated collective
 reson. 3=24943
 spinel-type solid solutions, rel. to composition and degree
 of inversion 3=20830
 square-mound-potential gas, classical fluid theory 3=7864
 substances with helical magnetic structure,
 inelastic 3=18097
 transition metal and rare earth ions, rel. to "paired"
 electrons 3=977
 transport eqn., effect of scatt. term 3=19647
 vel. depend. transport with high-energy sources 3=10126
 water, hindered rotation theory 3=17284
 water, inelastic; energy distrib., 25° and 75° C 3=127
 water, small-energy rotational transitions 3=23869
 A < 65, 3.5 MeV, polarization 3=2470
 Al, at 8.3 BeV 3=6257
 by Al²⁷, elastic and inelastic, 0.98-3.99 MeV 3=6140
 Al, elastic, 24 MeV, polarization 3=6255
 by Al, fast neutrons 3=6254
 by Al²⁷, 2.76 MeV, elastic and inelastic 3=15207
 As, coherent scatt. amplitude 3=25201
 B¹⁰, 19 keV, resonances 3=17486
 Ba, elastic, Wigner cusp obs. near threshold 3=22394
 Be, anisotropy rel. to Debye temp. 3=4823
 Be, slow neutrons, lattice dynamics 3=747
 BeO, defects due to neutron irradiation 3=8426
 BeO, 5-6 Å, 100-400° K, calc., one and two-phonon
 processes 3=20099
 BeO, polycryst., inelastic, 100°-1000° K 3=12911
 BeO, rel. to temp. and microstructure 3=4403
 BeO, slowing-down of fission neutrons to 1.44
 and 0.3 eV 3=4404

Neutrons and antineutrons — contd
scattering — contd

- by Bi, D-T neutrons, time-of-flight expt. 3=6011
 Bi, elastic low-angle, at 14.2 MeV 3=22398
 Bi, elastic, at 15.2 MeV, ang. distrib. 3=2467
 Bi, elastic, 24 MeV, polarization 3=6255
 Bi²⁰⁹, inelastic, 2.95 MeV, γ -ray spectra 3=8106
 by Bi, inelastic, 14.8 MeV 3=2464
 C, at 8.3 BeV 3=6257
 by C, D-T neutrons, time-of-flight expt. 3=6011
 C, elastic, 24 MeV, polarization 3=6255
 by C¹², 14 MeV 3=15206
 C, 14 MeV, n, γ coincidences 3=17476
 C, 14 MeV, inelastic, n¹- γ ang. correl. 3=24944
 by C, inelastic, 14.8 MeV 3=2464
 C¹²(n,n¹), virtual excitation 3=12685
 by C, 1 MeV, elastic, polarization 3=12680
 by C¹², phase shift analysis 3=15204
 C¹³, polarization ang. distrib. calc., 1.45-
 4.10 MeV 3=19857
 Ca, elastic, above 6 MeV, optical model 3=672
 by Ca, elastic, 3-4 MeV 3=19856
 Ca, 14 MeV, n, γ coincidences 3=17476
 Ca(OH)₂, lattice vibrations study 3=17643
 Ce, elastic, Wigner cusp obs. near threshold 3=22394
 Ce¹⁴⁰, near threshold 3=6212
 Co⁵⁹, thermal, spin depend. 3=15213
 Cr, inelastic, at 0.98-3.31 MeV, γ -ray spectra 3=2466
 Cu, at 8.3 BeV 3=6257
 by Cu, polarizing power for 3.4 MeV neutrons 3=22392
 Cu, U, Th, at 0.8 and 2.8 MeV, small angle 3=4646
 D₂, quantum states transition 3=25074
 Fe, elastic, 24 MeV, polarization 3=6255
 Fe, elastic, Wigner cusp obs. near threshold 3=22394
 Fe, inelastic, critical 3=3120
 Fe, polarized neutrons, spin wave theory 3=6717
 Fe₃O₄, rel. to spin-wave dispersion curves 3=1152
 Ga, coherent scatt. amplitude 3=25201
 H₂, quantum states transition 3=25074
 by He⁴, 1.79 MeV, ang. distrib. 3=17281
 by He⁴, phase shift analysis 3=15205
 H₂S, gaseous, total cross-section 3=4733
 H₂S, liq., 0/0058-0.187 eV meas. 3=14141
 I¹²⁷, inelastic, 2.95 MeV, γ -ray spectra 3=8106
 In, coherent scatt. amplitude 3=25201
 In¹¹⁵, resonance, apparatus and method 3=6012
 by KH₂PO₄, low freq. H vib. 3=20384
 La¹³⁹, inelastic, 2.95 MeV, γ -ray spectra 3=8106
 Li, elastic, Wigner cusp obs. near threshold 3=22394
 Li^{6,7}, inelastic, 8.1-14.1 MeV 3=12683
 Li⁶ and Li⁷, optical model for 1.5-14 MeV 3=2469
 Mg, scattering length, coherent 3=25708
 Mg(OH)₂, lattice vibrations study 3=17643
 Mn⁵⁵ and Ho¹⁶⁵, 2, 5, 14 MeV, elastic 3=19828
 Mo, elastic, inelastic, 14 MeV, rel. to optical model
 calc. 3=673
 N¹⁴, 14 MeV, elastic, cross-sections 3=24945
 N₂, quantum states transition 3=25074
 NH₃, liq., mol. rotation hindrance det. 3=14140
 NH₄K₂I_{4+x}, rotation of NH₄⁺ meas. 3=15418
 NH₄PF₆, rotation of NH₄⁺ meas. 3=15418
 NH₄SO₄F, rotation of NH₄⁺ meas. 3=15418
 (NH₄)₂S₂O₈, rotation of NH₄⁺ 3=15418
 by Na crystals, inelastic, force consts. 3=15422
 Na, lattice dynamics study at 90° K 3=2709
 Na, liquid, dynamics, vibrational modes 3=1675
 Nb⁹³, inelastic, calc. and meas., and energy levels 3=15110
 Ni-base alloys, magnetic theory 3=12964
 Ni, inelastic cold neutron scatt., phonon spectrum
 study 3=25185
 Ni, inelastic, critical 3=3120
 Ni, polarized neutrons, spin wave theory 3=6717
 Ni, 900 keV, elastic 3=2463
 Ni-Pd alloy, magnetic, rel. to absorbed H 3=5020
 by O¹⁶, phase shift analysis 3=15205
 O, 900 keV, elastic 3=2463
 by O, 1 MeV, elastic, polarization 3=12680
 by O¹⁶, 2.5-3.2 MeV, polarization 3=22393
 O, 14 MeV, n, γ coincidences 3=17476
 O¹⁶, 14 MeV, elastic, cross-sections 3=24945

Neutrons and antineutrons — contd

scattering — contd

- O., quantum states transition 3=25074
 - Pb, at 8.3 BeV 3=6257
 - Pb, elastic low-angle, at 14.2 MeV 3=22398
 - Pb elastic, 24 MeV, polarization 3=6255
 - Pb²⁰⁸, inelastic, up to 4.5 MeV 3=17477
 - Pb, lattice dynamics study at 100° K 3=2708
 - Pb, solid and liquid, with cold neutrons 3=4823
 - Pu²³⁹, inelastic, 8.1-14.1 MeV 3=12683
 - Pu²³⁹, inelastic, and excitation functions 3=6184
 - Sb, coherent scatt. amplitude 3=25201
 - Se⁷⁷, low-energy, width of observed levels 3=4645
 - Si, 900 keV, elastic 3=2463
 - Sm¹⁴⁹, spin assignments of low-energy resonances, using polarized neutrons and nuclei 3=2468
 - Sn, at 8.3 BeV 3=6257
 - Sn, elastic, 24 MeV, polarization 3=6255
 - by Ta backings to Li targets, background effect 3=2472
 - Ta, elastic, at 15.2 MeV, ang. distrib. 3=2467
 - Ta¹⁸¹(n,γ) at 2.95 MeV 3=6256
 - Th, elastic low-angle, at 14.2 MeV 3=22398
 - Th, elastic, at 15.2 MeV, ang. distrib. 3=2467
 - Ti—Zr, disordered 3=17644
 - U, elastic low-angle, at 14.2 MeV 3=22398
 - U, elastic, at 15.2 MeV, ang. distrib. 3=2467
 - U, inelastic, rel. to slowing-down time in water 3=2275
 - by U, small angle, elastic, 18-120 MeV 3=8105
 - U²³⁵, inelastic, and excitation functions 3=6184
 - U²³⁵, inelastic, and excitation functions 3=6184
 - U^{235,238}, inelastic, 8.1-14.1 MeV 3=12683
 - U²³⁸, 40 keV-16 MeV, optical model calc. 3=4650
 - U²³⁸, 14.7 MeV, inelastic 3=8104
 - V, crystals rel. to electron and nuclear polariz-
ation 3=18057
 - V, inelastic, rel. to phonon spectrum 3=17641
 - W, elastic low-angle, at 14.2 MeV 3=22398
 - W¹⁸⁴, 0.3-1.5 MeV, elastic and inelastic 3=22399
 - Y, from Y₂O₃ diffr. 3=22391
 - Y⁸⁹, low-energy, width of observed levels 3=4645
 - Zr, elastic, Wigner cusp obs. near threshold 3=22394
 - Zr⁹⁰(n,n')Zr^{90m}, to 5 MeV 3=15208
 - by Zr, polarizing power for 3.4 MeV neutrons 3=22392
- scattering, proton-neutron**
- backward peak, narrow, 2-3 GeV, explanation 3=12464
 - below 20 MeV, non-S wave effects 3=14986
 - charge exchange, high-energy, ρ-meson Regge
trajectory 3=22190
 - cross-sections, Chew—Low extrapolation method 3=22129
 - and d form factor 3=19712
 - dynamical effects of molecular electrons 3=1618
 - dispersion reln. study at 10 MeV 3=10116
 - emulsion nuclei, at 9 GeV, slow pion prod. 3=596
 - phase-shift analysis, 210 MeV 3=2257
 - π⁰ prod. at 600 MeV 3=15006
 - polarization at 23.1 MeV 3=10121
 - quasifree, impulse approx. interpret. 3=22128
 - quasifree, 140 MeV, R and A parameters 3=22126
 - total cross-section at 0.4926 and 3.205 MeV 3=4399
 - 13.7-350 MeV, phase-parameter representation 3=585
 - 22.5 MeV, diff. cross-section 3=2268
 - 22.5-110 MeV, ang. distrib. 3=10120
 - 142 MeV, phase shifts analysis 3=12454
 - 200 MeV, cross-section π-nucleon interaction const. 3=7866
 - 2.04, 2.85 GeV, ang. distrib. 3=17285

Nickel

- annealing, in moist H₂, removal of anomalous mech.
props. 3=20722
- atomic scattering factor, in metallic state and in
NiO 3=25704
- atoms, electron radial distrib. 3=19934
- atoms, mesic, μ⁻ decay anomaly 3=15312
- atoms, Ni II spectrum, relative osc. strengths 3=10460
- in austenite, diffusion, effect on internal friction 3=20695
- cathodes, crystal phases, relation to adhesion and
emission 3=19131
- cold working, effect on hardness and conductivity,
electrical 3=13373
- creep and fracture at 500° C, prestrain effects 3=13361
- creep and fracture, 500°-600° C, impurity effects 3=25631

Nickel — contd

- creep, effect of polygonization, 550°, 700° and
900° C 3=20715
- creep in single crystals, meas. 3=20716
- creep, part not revealed structurally, mech. 3=18194
- crystal dislocations, deformed Ni, structure changes on
heating 3=17747
- crystallization, on Si, hexagonal 3=25666-7
- crystals grown from melt, substructures 3=1271
- crystals, mag. stray fields above 71° walls, meas. 3=8707
- Curie pt. thermodynamics 3=13244
- deformation ageing, theory 3=5072
- desorption energy of Ag 3=23521
- diffusion and mobility of Sb¹²⁴ 3=15511
- diffusion of Ag, surface 3=20232
- diffusion in Ag 3=22814
- diffusion in Ag, rel. to solubility 3=13006
- diffusion in pure Au, meas. 3=8449
- diffusion in Co—Ni alloys, mag. effects, near Curie
temp. 3=15514
- diffusion in Cu in Cu—Ni powder compact 3=2823
- diffusion in NiO, meas. and theory 3=2828
- diffusion reaction with S vapour, mechanism 3=1387
- dislocation prod. by low-energy ions 3=17723
- dislocation structure, effect of alloying 3=10658
- dislocations, rel. to stacking-fault energy 3=17744
- domain structure in epitaxial films 3=15830
- elec. props., rel. to density of states 3=6488
- electron emission charac. in gases 3=418
- electron emission, secondary, by relativ.
primaries 3=16979
- electron emission due to Ar⁺ bombardment 3=9843
- electron emission by H⁺ ions at 1+30 keV 3=24347
- electronic structure of impurity atom 3=12964
- emissive power, thermal 3=286
- energy band structure, 3d-electrons 3=25234
- Fermi surface, multiple connectivity 3=4842
- ferromag. domain structure 3=20591
- ferromag. props. rel. to band structure 3=8665
- ferromagnetic anisotropy, second const. 3=13246
- ferromagnetic, remanence/saturation mag. ratio, wire,
-180 to +100° C 3=23160
- ferromagnetic resonance 3=23203
- ferromagnetic reson., effect of surface condition
and defects 3=1172
- field emission, surface migration processes 3=7629
- film on oriented Ag, Pd, Ni, structure 3=1371
- film, structure, evaporated in inert gas, rel. to
catalysis 3=20929
- films, absorption, light, oxidation and wavelength
effects 3=17991
- films, aggregate structure obs. 3=1373
- films, anisotropic shape effects 3=15815
- films, chem. precipitated, structure and mag.
props. 3=5013
- films, domain structure and imperfections 3=8676
- films, elec. resist., effect of O₂ and BaO
adsorption 3=20271
- films, evaporated, single-crystal, internal stresses, effect
on mag. props. 3=13344
- films, ferromag. resonance 3=23205
- films, longitudinal Kerr magneto-optical effect 3=13157
- films, mag. domains, evaporated on cleaved NaCl 3=20931
- films, magnetic properties rel. to thickness and
structure 3=15823
- films, magnetization measurement 3=17020
- films, magnetization rel. to temperature 3=15821
- films, magnetization, saturation, effect of electro-
lytic H 3=20606
- films, magnetoresistance 3=17825
- films, mag. analysis by electron diffraction 3=5014
- films, monocrystal, superlattice structure 3=8835
- films, neutron irradiat. effects 3=22869
- films, optical consts. rel. to wavelength 3=10902
- films, single and polycrystalline, domain structure
obs. 3=18089
- films, structr. by electron diffraction 3=1369
- films, thin, electrical resistivity, rel. to thickness 3=17823
- films, ultrathin, saturation magnetization and
anisotropy 3=15822

Nickel — contd

- films, ~ 100A, conductivity, electrical up to 300°C, and activation energy 3=15538
 grain boundary cracking in creep failure 3=18195
 grain growth kinetics 3=20904
 grain structure, strength, effect of thermomechanical treatment 3=3234
 Hall effect anisotropy, crystal symmetry 3=841
 Hall effect and magnetoresistance, anomalous, localized d-electron model 3=827
 Hall effect in single cryst. and polycryst. 3=2853
 hardening curve, deduction from mag. props. 3=3231
 hardness, effect of electrolytic H 3=3245
 heat treatment, tempering, temp. between cylinder centre and surface 3=9641
 ions, paramagnetic resonance in double-nitrate crystals 3=6749
 lattice isotopic effects, temp. dependence 3=6482
 layer, separated from Al, tunnelling current 3=6489
 layers, electrolytically-deposited, orientation and morphology 3=18234
 liquid, viscosity 3=14115
 magnetic anisotropy of wires under small torsion 3=20577
 magnetic domains, temp. var. magneto-optical obs. 3=23165
 magnetic internal field, Au¹⁹⁷ Mössbauer data 3=6458
 magnetic moment distrib. 3=1110
 mag. props. rel. to plastic deformation 3=3231
 mag. resonance, temp. depend, wires, annealed 3=15793
 magnetic, stray fields above Bloch walls, meas. method 3=19402
 magnetic susceptibility, electronic sp. ht. 3=23143
 magnetic susceptibility at γ/d and melting point 3=8654
 magnetization distribution, domain boundary layers 3=25530
 magnetization, intrinsic, press. depend. 3=6700
 magnetization rel. to stress & temp. compared with Permalloy (94%Ni) 3=1142
 magnetization spontaneous moment, rel. to temp., 1.4° to 5°K 3=15782
 magnetization, temp. hysteresis 3=3101
 magnetocrystalline anisotropy rel. to field strength 3=20581
 magnetoelastic coupling, static, analysis 3=6701
 magnetoelectric effects, high-field meas. 3=25330
 magneto-optical effects rel. to optical consts. 3=10918
 magneto-optical and optical props., i.r. 3=10919
 magnetoresistance, high-field, in single crystals 3=15553
 magnetostriction and magnetization jumps 3=8664
 magnetostriction meas. up to 10⁴ atm 3=1150
 magnetostriction, temp. hysteresis 3=3101
 mechanical props. of single crystals rel. to neutron irradi. 3=8467
 n.m.r., longitudinal, model and expt. 3=3197
 n.m.r. of Ni⁶¹, saturation behaviour 3=25592
 neutron critical scattering 3=1117
 neutron form factors, spin density distrib., Hartree-Fock calc. 3=1103
 neutron scatt., inelastic, critical 3=3120
 neutron scatt., polarized, spin wave theory 3=6717
 99.95% pure, enthalpy 1120°-1919°C 3=8359
 (100) faces, bombard. by Ar⁺, Ne⁺ 3=13020
 optical props. and Fermi surface model 3=25331
 phonon spectrum, from cold neutron scatt. data 3=25185
 photoelectric yield, 3000-250 Å 3=21865
 plated deposits, structure 3=13450
 point defect clustering 3=22721
 polycrystalline characteristic temperature, 20°-600°C 3=17661
 porous, dynamic compression 3=6787
 powdered, Bloch wall suppression, n.m.r. study 3=15805
 precipitation in Si 3=6537
 recrystallization centres, growth kinetics 3=20794
 recrystallization temp. lowering, by zone refining 3=18263
 resistance, electrical, and work function, effect of adsorption of electropositive atoms 3=13040
 rotational hysteresis, rel. to cold rolling and recrystallization 3=18078
 shear modulus, rel. to deform. amplitude 3=6779

Nickel — contd

- shear modulus and internal friction, temp. var. 3=3209
 shock compression up to 9 x 10⁶ atm. 3=6786
 single crystals, reversible susceptibility, rel. to magnetizing field and crystal orientation 3=20572
 solubility in Be, X-ray diffract. study 3=20908
 sputtering, by Ne⁺, Ar⁺, Kr⁺, Xe⁺ ions, 100-1000 eV 3=4216
 stacking faults, prod. by plastic deform. 3=20206
 strain ageing, rel. to temperature 3=13350
 strength, long-term, effect of thermomech. treatment 3=8778
 surface diffusion of Sn 3=6539
 temp. change at boundary with superfluid He 3=5570
 thermal and elec. cond. in mag. field, low temp. 3=8489
 thermal expansion 3=4825
 thermal expansion, 20-500°C 3=2735
 thermionic emission of ions, effect of ambient gas 3=14663
 thin films, elec. resist. rel. to temps. and Hall e.m. force, 2° to 300°K 3=832
 thin films, electrical props. at 300°K 3=4905
 thin films, mag. props. rel. to cathodic hydrogen 3=1075
 thin films, mag. props. rel. to pressure during evaporation 3=1072
 thin films, spin-wave res. 3=1169
 thin layers, ferromag. Curie point 3=1077
 triton range, 0.2-2.7 MeV 3=10180
 twinned cubes, by high temp. reduction by NiCl₂ in KCl 3=5078
 twinning, mechanical 3=25621
 two magnon spin-spin relax., model 3=1193
 u.v. and visible radiation, by H ion bombardment, 200 keV 3=7657
 vaporization, heat of, at 298°K 3=1876
 whiskers, tensile rupture tests 3=6801
 wire, elastic moduli, effect of 60 c/s mag. field 3=15970
 wires, thin, magnetization process and domain struct. 3=1087
 X-ray M bands from Cu-Ni system 3=23087
 yield point, temp. dependence rel. to purity 3=5066
 Ba-coated, reversed thermionic emission 3=21860
 Ba-coated, thermionic emission, theory and expt. 3=21859
 Ni⁶³, diffusion in PbS 3=17785
 Ni²⁺, e.s.r. in CaO 3=3181
 Ni²⁺, line broadening of P³¹ n.m.r. absorpt. in H₂PO₄ 3=13316
 Ni²⁺ in organic solvents, NaCl and KCl, optical props. 3=10923
 Ni²⁺, spin level splitting, Jahn-Teller effect 3=10452
 Ni²⁺, in AgBr, AgCl, paramag. reson. and relax., liquid H temps. 3=13307
 O and H absorption on (110) face, elec. diffraction study 3=1378

Nickel compounds

- alloys, binary, with Al, Cu, Co, grain shift and boundary migration 3=2815
 alloys, high, elastic consts., from u.s. velo., wedge method 3=23277
 alloys, superconductivity 3=16873
 Al₂Si₂, magnetic hysteresis loops, eddy-current broadening 3=15790
 EI-437A alloy, precipitation 3=8913
 ferrite, anisotropy prod. by rotary field tempering 3=15892
 Inconel, total hemispherical emittance 3=289
 Inconel-X, electron microscope obs. 3=20872
 Invar, internal friction, temp., C-content and magnetization depend. 3=3217
 Invar, isothermal holding, internal friction, magneto-diffusion effect 3=3216
 Monel, Curie point, by simple balance method 3=8636
 Nichrome films, vacuum dep., strain sensitivity 3=23514
 Nichrome, phase transform. volume changes 3=20885
 nichrome wire, in centre of glass pipe, water cooled, burnout 3=9661
 Nimonic-type alloys, ageing, rel. to structure changes 3=16113
 nitrides, phase transformation by N insertion 3=1322
 Permalloy, with 5% Mo, mag. props., effects of proton bomb. 3=15863

Nickel compounds — contd

- Permalloy films 3=15819
 permalloy, films, coercivity and conductivity, electrical 3=13041
 Permalloy films, domain structure and preferred-axis dispersion 3=15812
 Permalloy films, domain structure changes 3=18088
 Permalloy films, effective magnetization, anisotropy 3=20596
 Permalloy, films, ferromagnetic resonance 3=15917
 Permalloy films, ferromag. resonance 3=20633
 Permalloy films, flux reversal by Néel wall motion 3=15845
 Permalloy films, impulsive magnetization 3=15848
 Permalloy films, isotropic, mag. props. 3=23169
 Permalloy films, longitudinal Kerr magneto-optical effect 3=13157
 Permalloy, films, mag. anisotropy and hysteresis 3=15837
 Permalloy films, magnetic properties rel. to added Cu and Co 3=15816
 Permalloy, films, magnetic props., effect of surface roughness 3=15840
 Permalloy films, magnetization process, rel. to dispersed anisotropy 3=15811
 Permalloy films, magnetoelastic sensitivity 3=15842
 Permalloy films, regional variation of anisotropy in ferromagnetic resonance 3=25556
 Permalloy films, spin pinning at surface 3=15839
 Permalloy films, spin-wave resonance 3=15920
 Permalloy films, spin-wave resonance 3=15922
 Permalloy films, structure, effect of growth conditions 3=16047
 Permalloy films transverse magnetization 3=18087
 Permalloy films, use in transmission delay line 3=14732
 Permalloy, longit. permeability of films 3=15831
 Permalloy, mag. props. of very thin films 3=15832
 Permalloy (94%Ni), magnetization rel. to stress & temp. compared with pure Ni 3=1142
 Permalloy, thin films, homogeneity, by ferromagnetic resonance 3=18393
 Permalloy, various types of mag. film, props. 3=15836
 Permalloys, long-range ordering, diffractometer study 3=18337
 phosphates, substituted, spectra, 6-30 μ 3=15686
 Ni-Al bronze, β - α reaction, segregation 3=18352
 NiAl, electron distrib., X-ray meas. 3=16092
 NiAl, n.m.r. of Al²⁷, Knight shift and line intensity 3=23270
 NiAl, ordering rel. to composition 3=16104
 Ni-(Al, Co), mechanism of plastic deformation 3=23332
 Ni alloys, dilute, mag. moment distrib., neutron scatt. study 3=15858
 Ni alloys, impure, d-band structure 3=10622
 Ni-base alloys, K state and binding forces 3=5114
 Ni alloys, magnetoresistance and Hall effect, rel. to ferromagnetism 3=15551
 Ni-base alloys, neutron mag. scatt. theory 3=12964
 Ni alloys, with Ce, Pr and Cd, coercive force, deformation and annealing effects 3=23159
 Ni ammonium salts, thermal recovery after n-irrad. 3=8472
 Ni arsenides, atomic moments and magnetic coupling 3=15738
 Ni-Au, internal friction, meas. rel. to temp. 3=1217
 NiB, crystal structure, rel. to similar types 3=18338
 NiB, paramag. props. (150-800°K) and thermo-electricity 3=1124
 Ni-Be, aged, orientations of new phases 3=16099
 Ni-Be, ageing, crystal structure changes 3=13507
 NiBr, emission spectrum, band heads, 4000 to 4500 Å 3=10512
 Ni₃C, cryst. struct., by electron diffraction 3=1324
 Ni-C, crystallization, effect of Bi, Ca, Li impurities 3=16115
 Ni chromite, mag. props. and crystal chemistry 3=1011
 NiCl₂, antiferromagnetic ordering 3=20625
 NiCl₂, antiferromagnetic properties 3=20626
 NiCl₂, spin waves, semicontinuum model 3=13280
 Ni-Co alloys, dislocations, rel. to stacking-fault energy 3=17744

Nickel compounds — contd

- Ni-Co alloys, ferromagnetic relaxation and related phenomena 3=8681
 Ni-Co alloys, stacking faults, prod. by plastic deform. 3=20206
 Ni-Co, ferromag. anisotropy, ordering theory 3=18073
 Ni-Co, ferromag. domain patterns 3=18079
 NiCO₃, antiferromagnetism, observation 3=1115
 Ni(CO)₄, bond length shortening, theory 3=10497
 Ni-Co f.c.c. solid soln., induced magnetic anisotropy 3=1041
 Ni and Co ferrite-chromite series, anomalous mag. moment 3=25544
 Ni(CO)₄, isotope exchange with CO 3=3380
 NiCO₃, specific heat, 1.6° to 70°K, rel. to antiferromag. transition 3=17659
 Ni_{1-x}Co_xFe₂O₄-BeO.Fe₂O₃, constricted hysteresis loop 3=1085
 Ni_{1-x}Co_xFe₂O₄-Fe₂O₃, constricted hysteresis loop 3=1085
 Ni_{1-x}Co_xFe₂O₄, mag. anisotropy 3=1033
 Ni-Co-P films, ferromag. shape anisotropy 3=20602
 Ni-Cr alloys, tensile strength increase, by low-temp. annealing 3=25637
 Ni-Cr base alloy, fine structure and mech. props., heat effects 3=18351
 Ni-Cr basis polycrystalline alloy, Fe diffusion, 1050°-1250°C 3=20231
 Ni-Cr, creep fracture 3=3239
 Ni-Cr, mag. moments, neutron diffr. study 3=20608
 Ni-Cr, magnetization up to 15 kOe, 0°-300°K 3=5010
 Ni-Cr-Fe, effects of high-temp. absorpt. of C 3=3347
 Ni-Cr-Fe, Cr diffusion, 1294°C 3=20231
 Ni-Cu alloys, stacking faults, prod. by plastic deform. 3=20206
 Ni-Cu alloys, thermoelectric power variation in magnetic fields 3=20427
 Ni-Cu (30%), domain wall velo., effect of plastic deformation and irradiation 3=11068
 Ni-Cu, forced magnetoresistance 3=13042
 Ni-Cu, mag. susceptibility, electronic sp. ht. 3=23145
 Ni-Cu, magnetization up to 15 kOe, 0°-300°K 3=5010
 Ni-Cu thin films, spin-wave res. 3=1169
 Ni cyanide-NH₃ complexes, X-ray powder patterns 3=1406
 NiF₂, antiferromagnetic resonance in far i.r. 3=15930
 NiF₂, spin waves and n.m.r. in domain walls 3=18114
 Ni-Fe alloy, thin films, torque, angular dependence 3=1071
 Ni-Fe alloy, transformation by N atom insertion 3=1323
 Ni-Fe alloys ferromagnetic resonance 3=23203
 Ni-Fe in chondrites 3=9186
 Ni₃Fe, creep, anomaly, explanation 3=23336
 48% Ni-Fe cubic face-centred, mag. props., -130°C, and diffusion, H 3=15853
 Ni-Fe f.c.c. solid soln., induced anisotropy 3=1041
 NiFe ferrite, mag. anisotropy, influence of empty cation sites, 200-300°C 3=6726
 Ni-Fe ferrite, natural ferromag. res. 3=3156
 Ni-Fe ferrite, relaxation loss 3=8691
 Ni-Fe ferrites, with small Co-substitution, induced anisotropy 3=1035
 Ni-Fe ferromag. anisotropy, ordering theory 3=18073
 Ni₃Fe, ferromag. anisotropy, rel. to ordering 3=18072
 Ni₃Fe, ferromagnetic anisotropy, ordering, on annealing 3=23155
 Ni-Fe films, domain behaviour rel. to anisotropy 3=15818
 Ni-Fe films, domain walls 3=15829
 Ni-Fe films, electrodeposited, mag. props. 3=25537
 Ni-Fe films, Hall effect and spontaneous mag. 3=22907
 Ni-Fe, films, internal stresses rel. to domain structure 3=20595
 Ni-Fe films, mag. anisotropy, positive and negative 3=1067
 Ni-Fe films, mag. props. rel. to anisotropy dispersion 3=18083
 Ni(80%)-Fe(20%) films, magnetization reversal 3=1082
 Ni-Fe, films, magnetization reversal, static 3=13236
 Ni-Fe films, magnetoresistance meas. 3=14470
 Ni-Fe films, negative magnetic anisotropy 3=15807

Nickel compounds — contd

- Ni-Fe films, rotatable mag. anisotropy, rel. to magnetostriction 3=15843
- Ni-Fe films, spiral and concentric domain walls 3=15246
- Ni-Fe (80/20%) films, u.s. switching of magnetization vector 3=15826
- Ni(40-100%)-Fe films, uniaxial anisotropy, torque meas. 3=15814
- Ni-Fe films, use in weak mag. field meas. 3=14722
- Ni-Fe films, wall movement, field strength 3=18090
- Ni-Fe, forced magnetoresistance 3=13042
- Ni-Fe layers, evaporated, composition 3=18377
- Ni(40-100%)-Fe, mag. anisotropy 3=1069
- Ni-Fe, mag. props. rel. to prep. method 3=1073
- Ni-Fe, mag. small-signal behaviour, domain wall model 3=25528
- Ni-Fe, magnetoelastic, anisotropy, single crystals, temp. depend. 3=18075
- Ni₃Fe, magneto-optical res. rel. to d-electron Stark transits 3=6645
- Ni-Fe, ordering, strain ageing 3=8775
- Ni-Fe, origin and growth of annealing twins 3=25756
- Ni-Fe, switching by non-coherent rotation 3=1081
- Ni₃Fe, tensile characteristics, rel. to order 3=23352
- Ni-Fe thin films, domain struct. and magnetization reversible rotation by Faraday effect 3=1079
- Ni-Fe thin films, magnetic anisotropy 3=1068
- Ni (80%)-Fe (20%) thin films, oxide layer surf. spin pinning 3=1168
- Ni-Fe, thin films structure and anisotropy rel. to minor constituents 3=1074
- Ni₈₀Fe₁₇Co₃ alloy, films, varn. of dispersion angle with thickness 3=8675
- Ni-Fe-Co alloys, mag. wall-wall interaction between films 3=15833
- Ni-Fe-Co film memory devices, effect of skew 3=14734
- Ni-Fe-Co films, mag. reversal behaviour 3=23171
- Ni-Fe Cr ferrite, Faraday effect rel. to permittivity 3=1050
- (Ni_{0.98}Fe_{0.04})Fe₂O₄, ferrimag. line width 3=1160
- Ni₃Fe-(3%)Mo, rel. to K-state formation, rel. to excess vacancies 3=13531
- 50 or 79% Ni-Fe, 4-5% Mo, tapes, 3-30μ in thick, mag. reversal, h.f. and impulse 3=15794
- Ni₂Fe₂O₄, films, Faraday rotation and mag. hysteresis 3=15655
- NiFe₂O₄, flux growth by Czochralski method 3=16043
- Ni_{1-x}Fe_{3-x}O_{4+y}, magnetic after-effect 3=1036
- NiFe₂O₄, Ni²⁺ contrib. to lattice distortion 3=1012
- NiFe_{2-x}V_xO₄ spinel, sat. magnetization and susceptibility rel. to temp. 3=1008
- Ni ferrite, growth and props. of single crystals 3=3270
- Ni ferrite, initial permeability, effect of wall dimensions 3=3123
- Ni ferrite, memory core, switching properties 3=15874
- Ni ferrite, resistivity, change on mag., anisotropy 3=17927
- Ni ferrite, single crystals prep., mag. props. 3=13274
- Ni ferrites, polycryst., spin waves 3=3126
- Ni²⁺.6H₂O complex, orthorhombic crystalline field theory 3=20053
- Ni(H₂O)₆SO₄, crystal structure 3=1339
- Ni, halide complexes, tetrahedral, spectra 3=15354
- Ni hydride, f.c.c. lattice, H atom positions 3=25709
- Ni-Mn alloys, saturation magnetization, rel. to volumetric compression 3=8668
- Ni₃Mn atomic ordering temp. and mag. moment 3=20623
- Ni₃Mn, electron pair annihilation radiation ang. distrib. 3=17694
- Ni₃Mn mag. moment and atomic ordering temp. 3=20623
- Ni₃Mn mag. structure rel. to order 3=18080
- Ni-Mn, magnetization up to 15 kOe, 0°-300°K 3=5010
- Ni₃Mn, magnetization, temp. depend., antiferromag. exchange interaction 3=20583
- Ni₃Mn, magneto-optical res. rel. to d-electron Stark transits 3=6645
- Ni-Mn magnetostriction 3=23177
- Ni-Mn, ordering, effect of plastic deform. 3=5133
- Ni₃Mn, ordering kinetics, elec. and mag. props. 3=3329
- Ni₃Mn, transformation, order-disorder, from Mössbauer effect 3=13528

Nickel compounds — contd

- Ni_{1-x}Mn_xO, prep., semicond. and ferrimag. props. 3=13078
- Ni-Mo alloy, grain growth kinetics 3=20904
- Ni-Mo solid solutions, X-ray spectra fine struct. rel. to binding forces 3=5141
- NiMoO₄, crystal structure 3=5110
- Ni(NH₃)₆(NO₃)₂, elastic and thermoelastic props. 3=18161
- Ni(NH₃)₆(SO₄)₂.6H₂O, absorption spectra, 1.7° to 290°K 3=13180
- Ni(NO₃)₂.4H₂O, crystals unit cell and space group, by X-ray diffr. 3=16084
- NiO, adsorption of H₂ and CO 3=25781
- NiO, adsorption of O₂, neutron effects 3=13567
- NiO, antiferromag. domain walls 3=15912
- NiO, antiferromag., electron diffraction exam. 3=3135
- NiO, antiferromag. structure 3=1157
- NiO, antiferromagnetic magnetostriction 3=1016
- NiO, antiferromagnetic T-domain walls 3=20622
- NiO, atomic scatt. factor of Ni 3=25704
- NiO, birefringence pattern rel. to antiferromag. domains 3=18109
- NiO, chemisorption of O₂ and H₂ after neutron irradi. 3=3366
- NiO, conduction mechanism by internal friction meas. 3=10836
- NiO, conductivity electrical, var. with Li impurity 3=20337
- Ni₃O, crystal formation on Ni surfaces 3=18264
- NiO, crystal structure, antiferromag. 3=18111
- NiO, crystal structure, atomic, temp. factors 3=23444
- NiO, dielec. props., 100 c/s-1Mc/s 3=13107
- NiO, diffusion of Ni, meas. and theory 3=2828
- NiO, electronic structure 3=25235
- NiO, far i.r. antiferromag. reson. 3=8703
- NiO fine grains, mag. susceptibility rel. to diam., 20 to 400 Å 3=1094
- NiO fine grains, superparamag. and superantiferromag. props. 3=1093
- NiO, fine particles, antiferromagnetic properties 3=8697
- NiO, Hall effect, var. with Li impurity 3=20337
- NiO, mag. structure, neutron diffr. study 3=3289
- NiO, multiple twin domains and domain walls 3=1146
- NiO, neutron irradiated, sorption of O₂, H₂, N₂O 3=13604
- NiO, neutron magnetic form factor 3=1104
- NiO, Ni²⁺ form factor 3=978
- NiO, particles 20-400 Å diam., mag. props. 3=3137
- Ni_{1-x}O, powdered, electrical resistivity rel. to temp. and Ni content 3=13077
- NiO, semiconductor carrier mobilities, var. with Li impurity 3=20337
- NiO-type semiconductors, carrier mobility, low, polaron theory 3=8526
- NiO, sorption of H₂, 20-400°C 3=13603
- NiO, sorption of O₂, 20-400°C 3=13603
- NiO, thermoelectricity, var. with Li impurity 3=20337
- NiO ultra fine particles, antiferromag., susceptibility meas. 3=1095
- NiO₂Cu preparation and crystal structure 3=8856
- NiO.(1-x)Fe_xO₃.xAl₂O₃, ferrimag. compensation pts. 3=13268
- NiO₂Na preparation and crystal structure 3=8856
- Ni orthosilicates, mag. props. 77°-300°K 3=23142
- Ni-P solid solutions, acid deposited, atomic structure 3=20875
- Ni-P solid solutions, acid deposited, on heating, X-ray diffr. obs. 3=20876
- Ni-Pd, elec. and mag. props., effect of H 3=20269
- Ni-Pd, mag. neutron scatt., rel. to H content 3=5020
- Ni-Pd thin films, spin-wave res. 3=1169
- Ni, Pt, effect of short-range order and annealing on micro hardness and charact. temp. 3=8906
- Ni(II) pyridine complexes, i.r. spectrum of thiocyanate group 3=22581
- NiRh₂O₄, antiferromagnetism, crystal transformation 3=23196
- NiS, formation at Ni surface, diffusion process 3=1387
- NiS, para-antiferromag. transition, neutron diffr. study 3=15748
- Ni-S, phase diagrams and electrical conductivity 3=25734
- NiS, self-diffusion of Ni in polycrystals 3=20221

Nickel compounds — contd

- NiS, self diffusion of S^{33} , 820-885° C, Ni^{63} , 750-880°C 3=8451
 NiSO₄·H₂O, crystal structure 3=18327
 NiSO₄·6H₂O, double refraction 3=20446
 NiSO₄·7H₂O, u.s. velocities, elastic consts., and structure 3=20690
 α -NiSO₄·6H₂O, NiSO₄·7H₂O, low temp. mag. props. 3=8644
 Ni—Se, heated to 600°C, electron diffrn. study 3=25788
 Ni—Se, phase diagrams and electrical conductivity 3=25734
 Ni₁₋₄Sn, mag. moment rel. to sublattice metallic and covalent nature 3=1005
 Ni—Ta alloy, grain growth kinetics 3=20904
 Ni—10.1 at.% Ti, precipitation of Ti, rel. to ferromagnetic Curie temp. 3=25755
 NiTiO₃, antiferromagnetism 3=15906
 Ni₂TiX, CsCl-type structure 3=1344
 NiX₂NH₃, (X = Cl, Br, I) f.c.c., e.s.r. linewidths 3=1188
 Ni—Zn alloys, α -f.c.c., thermodynamic properties 3=25746
 NiZn ferrite, ferromagnetic reson., 4.2 and 283°K, 3.2cm 3=6740
 Ni—Zn ferrite, growth, rel. to porosity 3=3269
 NiZn ferrite, irreversible magnetic stress effects in Raleigh region 3=8690
 Ni—Zn ferrite, u.s. wave propag. vel. and elastic const. 3=17652
 Ni—Zn ferrites, diffusion aftereffect below 90°K 3=5022
 Ni—Zn ferrites, elec. cond. rel. to porosity 3=4939
 Ni—Zn ferrites, electric rel. to magnetic properties 3=8684
 Ni—Zn ferrites, electrical props. 3=20336
 Ni—Zn ferrites, elec. resist., pressure depend. 3=4940
 Ni—Zn ferrites, polycrystalline, crystals growth 3=6822
 NiZn ferrites, thermal conductivity 3=17669
 Ni—Zn ferrites, thermal cond. meas., 20°-400°C 3=25214
 NiZnCo ferrite films, and mag. props. 3=16140
 NiZnCo ferrite, mag. dispersion rel. to sintering temp. and composition 3=18100
 Ni—Zn—Co ferrite, mag. props. and annealing 3=3130
 Ni—Zn—Co ferrites, magnetocryst. anisotropy 3=23190
 NiZnCo ferrites, magnetoelastic effect 3=20614
 Ni_{1-x}Zn_xFe₂O₄ thermal conductivity 3=4831
 Ni₂ZrAl, Cs Cl-type structure 3=1344
 XNi₂ (X = yttrium or lanthanide), magnetic props. of Laves phases 3=15746

Night sky

See Airglow.

Nightglow

See Airglow.

Niobium

- alloys, superconductivity 3=16873
 anodic film, structure 3=23507
 anodization, radio tracer study by Cl^{36} and S^{35} 3=25830
 band structure from X-ray spectra 3=4979
 catalytic reaction with propylene 3=13605
 chemical analysis, in Ta foil, using $Nb^{93}(p,n)Mo^{93m}$ 3=8992
 creep, compressive, 800°-1200°C 3=13362
 diffusion, in liquid cast Fe, by electrolysis 3=5431
 electron scattering, energy loss 3=2040
 embrittlement by surface gas contamination 3=20755
 energy band structure by isochromat meas. 3=15468
 Fermi levels, from X-ray emission bands 3=4838
 flow stress rel. to temp., mechanisms 3=13352
 internal friction peaks, deform.-induced 3=23303
 interstitial—dislocation interaction 3=23309
 $L\beta_2$ emission band, correction 3=4978
 magnetization curves, rel. to superconductivity 3=11066
 neutron induced lattice defects rel. to resistivity 3=22769
 neutron resonance absorption meas. 3=17484
 persistent currents, mag. effects 3=3951-2
 plastic flow and yielding 3=23314
 single crystals, dislocations 3=22780
 single crystals, supercond., mag., thermal props. 3=5589
 specific heat, 1200°-2400°K 3=10596
 stress, shear, under pressure, annular specimens 3=6784
 superconducting energy gap, by electron tunnelling 3=333
 superconducting, high field transition 3=19114
 superconducting, negative surface free-energy effects 3=3961

Niobium — contd

- superconducting, surface electrical losses, in l.f. fields 3=12033
 superconducting transition temp. 3=22662
 superconductive temp. controller, below 1°K 3=1880
 tensile yield stress, effect of strain-rate 3=1237
 thermal cond. meas., 1.6-15°K 3=25215
 X-ray spectrum, absorpt. edges, L_{III} L_{II} 3=23095
 Nb⁴⁺ ions in ethanol glass, e.s.r. 3=15946

Niobium compounds

- oxides, structure and transformation, from X-ray and electron diffr. 3=13458
 Nb₃Al, supercond., evidence for negative surface energy models 3=5591
 Nb₃Al, superconductivity and mag. props. 3=14455
 NbB, crystal structure, rel. to similar types 3=18338
 Nb—C, phase equil. to 63.5 at.% C 3=18342
 Nb₃C, supercond. invest. down to 1.98°K 3=7406
 NbCr₂, polymorphous transformations 3=5119
 Nb—Fe, low temp. resistivity 3=13035
 Nb(Ga, In, Sb)_xSn_{1-x}, supercond., zero field transition curves 3=3960
 Nb_{0.30}Mo_{0.70} alloy, superconducting, 0.016°K zero field transition 3=21665
 Nb—Mo, b.c.c., mag. suscept., and H-affinity 3=3084
 Nb—Mo, Nb⁹³ Knight shift meas. 3=8737
 Nb—Mo, paramag. susceptibility rel. to temp. 3=999
 Nb—N cpds., $L\beta_2$ emission band, correction 3=4978
 Nb—Ni, structure of W₂Fe, type 3=16093
 NbO, vacancy interaction energy 3=2785
 α -Nb₂O₅, elec. cond. of nonstoichiometric 3=6602
 α -Nb₂O₅, elec. cond. 900° to 1400°C 3=8527
 Nb₂O₅, elec. props. rel. to O₂ pressure 3=2923
 α -Nb₂O₅, thermolec. power 3=23026
 Ni oxides, layers on Ni at 900°C in air, X-ray diffr. exam. 3=16129
 Nb₂O₅—Bi₂O₃ systems, phase equil, relns. 3=6813
 2Nb₂O₅·Ta₂O₅, unit cell and space group 3=5111
 Nb—Re, b.c.c., mag. suscept. and H-affinity 3=3084
 Nb—Ru, structure and electronic props. 3=22662
 Nb₃Si, structure 3=13514
 Nb—Sn films, diffusion, supercond., prep. and props. 3=19118
 Nb—Sn, phases, 800-1000°C 3=8893
 Nb₃Sn, supercond., structure, props. 3=5592
 Nb₃Sn films, superconducting critical current, temp. and mag. field var. 3=19120
 Nb₃Sn solenoids, superconducting 3=3968
 Nb₃Sn strip, superconducting 3=21664
 Nb₃Sn, supercond. 3=14458
 Nb₃Sn, supercond., evidence for negative energy models 3=5591
 Nb₃Sn, superconducting, crit. current density 3=5575
 Nb₃Sn, superconducting, effect of adding Ag on crit. parameters 3=19117
 Nb₃Sn superconducting hollow cylinder in pulsed mag. fields up to 8.2 kG 3=19116
 Nb₃Sn superconducting magnets, short wire tests 3=19408
 Nb₃Sn, superconducting, prep. 3=5590
 Nb₃Sn, superconducting, as permanent magnet 3=338
 Nb₃Sn, superconducting transition temp., compression and isotope effects 3=16874
 Nb₃Sn, superconductivity and mag. props. 3=14455
 Nb₃Sn superconductor, critical mag. fld., upper limit 3=337
 Nb₃Sn, thermal expansion, jump at supercond. transition 3=16875
 Nb₃Sn, thin surf. layers, supercond. rel. to mech. stress effects 3=1903
 Nb—Ta alloys, superconducting, upper crit. field, temp. depend. 3=19119
 Nb—Ta, paramag. susceptibility, rel. to temp. 3=999
 Nb—Th alloy, as high-field high-current superconductor 3=14457
 Nb—Ti alloys, superconducting, upper crit. field, temp. depend. 3=19119
 Nb—Zr alloys, superconductivity, hardness 3=19115
 Nb—Zr persistent currents, mag. effects 3=3951-2
 Nb—Zr solenoid, supercond., current-carrying capacity 3=3969

Niobium compounds — contd

- Nb—Zr solenoid, supercond., in 400 MeV proton flux 3=3970
 Nb—Zr solenoid, supercond., persistent current obs. 3=9685
 Nb—Zr, supercond. anisotropy in mag. field 3=14452
 Nb—Zr, superconducting crit. current, effect of annealing temp. 3=14460
 Nb—Zr, supercond. crit. currents in mag field 3=21667
 Nb—Zr, supercond. and normal, Hall coefft. 3=13043
 Nb—Zr supercond. solenoids, remanent mag. fields 3=14459
 Nb—Zr, supercond. solenoids, transition to normal state 3=21670
 Nb—Zr, superconducting, at 9250 Mc/s 3=21666
 3Nb—Zr, superconducting, crit. current density 3=5575
 NbZr superconducting electromagnet, field collapse 3=19409
 Nb—Zr, superconductivity high-field solenoid 3=3971
 Nb—25% Zr wire, supercond., normal region propag., effect of Cu plating 3=14456
 Nb—Zr wires, supercond., critical currents 3=14454

Nitrogen

- absorbed by W, effect on surface potential 3=12225-6
 active, r.f. excited, free electron density 3=1935
 adsorption isotherms, rapid flow method 3=11325
 adsorption by Mo, films, 10^{-6} – 10^{-8} mm, -195–+22°C 3=16146
 adsorption, multilayer, on hexagonal BN 3=6894
 afterglow, Lewis-Rayleigh, decay rate 3=24244
 afterglow of pulsed d.c. discharge, recombination 3=21717
 arcs, cylind. symm., temp. distrib. and charact. 3=14557
 in atmosphere at 100 km, atom concn., from airglow NO spectra 3=3508
 atom, $A^3\Sigma_u^+$ state, half-life 3=19940
 atom, $1s^22s^22p^n$ states, self-consist. field functions 3=19942
 atom, oscillator strength, Hartree-Fock calcs. 4=4708
 atom, photoionization of lower excited states 3=25048
 atom, $(2p)^3\ ^4S_{3/2}$ state, h.f.s., pressure shifts 3=8188
 atomic, chemiluminescence, in O and N reactions 3=25819
 atomic recombination, by e.s.r. 3=25068-9
 atomic system, continuous absorption coeff., rel. to stellar atmospheres 3=3599
 atoms, electron capture by protons 3=15303
 atoms, metastable, and auroral afterglow 3=2570
 atoms and molecules, 1.6–10 eV electron scattering 3=8207
 atoms, surface recombination upon quartz 3=5151
 aurora and twilight, N_2^+ production 3=13787
 breakdown, microwave, meas. 3=5648
 breakdown, microwave, meas. 3=14560
 charge transfer cross-sections 3=14530
 chemi-ionization in atomic mixtures with O 3=25820
 collisions with light element (Z=2 to 18) ions, electron loss 3=7448
 crystal structure of β -N 3=6839
 diffusion of Kr⁸⁶ in dense gas 3=1720
 dispersion, sound, up to 500 atmospheres, 500°C 3=7242
 elec. breakdown, u.h.f., time-lags 3=7491
 electron avalanche transition into streamers 3=24237
 electron avalanches, carrier amplification 3=9761
 electron diffusion—mobility coeffs. ratio 3=4023
 electron drift velocities meas. 3=12077
 electron drift velocity 3=9729
 electron irradi., free electron loss 3=14598
 electron and positron multiple scatt. 3=17248
 electron trapping by impurity in liquid argon 3=19175
 energy loss per ion pair for p and He⁺ 3=10281
 equilibrium props. behind shock waves 3=21493
 field desorption and corrosion of W and Ir 3=18396
 gas, acoustic isotherms 3=16659
 gas, Aston bands, rel. to ionization 3=4020
 gas, discharge detector 3=8993
 gas, discharge, l.p., "electron" and "vibrational" temps. 3=9763
 gas discharge, positive column, electron energy distrib. 3=4058
 gas, electron back diffusion in 3=5693
 gas flow, free-molecular, momentum transfer to metal surfaces 3=5456

Nitrogen — contd

- gas, fluorescence and pre-ionization 3=14220
 gas, ionization by H atoms and protons, 10–180 keV 3=5620
 gas, sound velocity and absorption 3=9509
 gas, velocity of sound 3=5497
 gas, viscosity, -78.5° to 100°C, below 200 atm 3=7223
 gas, Z-pinch discharge, rel. to pressure 3=9762
 gaseous, nucleation temp. 3=303
 gettering, electrical in low-pres. discharge in steel vessel 3=7461
 heat-transfer, ionization effects 3=18853
 ion collision data by ion cyclotron reson. 3=21697
 ion drift velocities in glow discharge 3=24221
 ion emission, field 3=19371
 ion mobility and electron attachment probabilities rel. to O₂ and water vapour 3=5624
 ion, N¹⁴, charge distrib. at high velocities 3=7447
 ionization ahead of cylindrical shock waves 3=1759
 ions, atomic, recombination, thermal and radiative props 3=7443
 ions, charge transfer with atomic O 3=14531
 ions in glow discharges, mass spectra 3=5643
 ions, N₂⁺, absorpt. coeff., 580–1000 Å 3=25101
 ions, N₂⁺, spectrum in aurora, use in temp. meas. 3=9104
 ions, N¹⁴, accel. to 100 MeV in ORIC 3=5734
 ions, range in gold, 0.4–6.4 MeV 3=4211
 liquid, automatic level controller 3=24125
 liquid systems, binary, with A, O and CO 3=132
 maser, optical, band spectrum stimulation in pulsed discharge 3=19499
 metal halide flames, with active N, metal spectra 3=22605
 metastable atoms and mols. from elec. discharge 3=2571
 molecular beam apparatus, high intensity 3=8316
 molecular beams, clustered, prodn. 3=2678
 molecular, in upper atmosphere to 400 km 3=9067
 molecular spectrum, far i.r., rot., collision induced dipole moments 3=17580
 molecule, $A^3\Sigma_u^+$ and $B^3\Sigma_u^-$ terms, splittings 3=6388
 molecule, absorpt. spectrum and electron structure 3=4754
 molecule, diamag. suscept. calc. 3=8259
 molecule, first negative system, in He 3=2622
 molecule, Goldstein-Kaplan bands 3=8262
 molecule, neutron scatt., quantum states transition 3=25074
 molecule, rotational transitions due to He 3=6431
 molecule, second positive spectral system 3=2620
 molecule, second positive system, effect of He 3=2621
 molecule, vacuum u.v. absorpt. spectrum 3=7329
 molecules, $A^3\Sigma_u^+$ state, by microwave discharge, diffusion, lifetime 3=17579
 molecules, absorption coeff., 580–1000 Å 3=25101
 molecules, dissociative charge transfer from He⁺ 3=24224
 molecules, long-lined metastable state at ~8 eV 3=2618-19
 molecules, rotational excitation in ionospheric D-region, electron cooling 3=3499
 pink afterglow, excitation mechanism 3=22486
 plasma, conductivity, thermal and electrical 3=7589
 plasma, high density, magnetic probe meas. 3=7583
 plasma jet, anode spot movements 3=14539
 plasma, N IV collective motion, spectr. meas. 3=24304
 plasma, ohmic heating by condenser discharge 3=7600
 plasma, optically thick in red, i.r. 3=16924
 plasma wrapped round Cu vapour, contraction and emission 3=7557
 positron annihil. in liq. and solid 3=17254
 radiation spectrum, shock wave heated 3=11835
 reactions with inert gases at high pressures 3=3387
 refractive index, vac. u.v., using Cherenkov radiation 3=14214
 refractivity, second virial coeff. 3=3835
 relaxation time, temp. depend. 3=8313
 rotation excit. by electrons, energy loss 3=17578
 solid, nuclear quadrupole resonance 3=8742
 solubility in Be, X-ray diffrac. study 3=20908
 solubility in H₂O, isotope effect 3=9450
 sound absorption, water vapour effects 3=18860
 sound wavelength meas. in tube 3=5502
 spectra, emission, excited by protons and H atoms 3=15338
 spectra in highly ionized state, meas. 3=10448

Nitrogen — contd

- spectra, N^{14} , h.f.s., pressure shift, 7-87 torr 3=19941
 spectral obs., r.f. excited jet 3=22545
 spectrum, N_2^+ , $D^2\Pi_g-A^2\Pi_u$ band origin wave-numbers 3=22547
 spectrum, N_2^{15} , u.v., isotopic shifts, anomalous 3=25102
 spectrum, from Van de Graaff beam passed through C foil and imaged on Raman spectrograph 3=19918
 Townsend ionization coeffs. 3=21708
 triton range, 0.2-2.7 MeV 3=10180
 u.s. absorpt., relaxation time 3=18857
 u.v. radiation excited by electron swarm 3=10515
 u.v. spectra, in pink afterglow 3=22485
 vacuum pumping, ion, mechanism 3=23946
 viscosity, at 127 atm. and low temps. 3=14191
 viscosity meas., oscillating disk method 3=14189
 viscosity when compressed to 5000 bars 3=14190
 and H_2 mixture, convection and thermal diffusion 3=19047
 N^{14} , hyperfine structure by electron paramagnetic resonance 3=6353
 N_2 , active, reaction with methylene chloride, quenching by CH_2Cl_2 3=11344
 N_2 adsorbed in mass spectrometers, ionization by charge transfer 3=24212
 N_2 arc, free-burning, voltage gradient 3=4072
 N_2 band spectra 3=10503
 N_2 boiling point, detm. 3=9659
 N_2 , Corona, positive burst charge formation, theory 3=372
 N_2 crystals, librational motion 3=745
 N_2 discharge rel. to air corona 3=4046
 N_2 electron avalanche components, temporal growth meas. 3=4086
 N_2 electron avalanche pulses, pd=100 to 2200 mm Hg 3=4085
 N_2 electron interchange with H atom beam 3=6342
 N_2 excitation by Ar, metastable, in plasma stream 3=8263
 N_2 excitation, from electron swarm energy distrib. 3=6391
 N_2 far u.v. spectrum, high-dispersion absorption 3=10513
 N_2 gas, u.s. vel. meas., 3.5 Mc/s at 3500 atm 3=1728
 N_2 ionization by protons, 0.15-1.1 MeV 3=4006
 N_2 liquid, reaction with dissolved O_3 , rel. to u.v. photolysis 3=3408
 N_2 molecule, diamagnetic susceptibility, theory 3=8240-1
 N_2 molecules, vibrationally excited, calorimeter study 3=12824
 N_2 -thermal electron collision cross-sections 3=22462
 N_2 , vibrational energy exchange with CO 3=20031
 $N_2 + H_2$, elec. discharge, spectr. study 3=4762
 N_2 - H_2 gaseous mixtures, n.m.r. rel. to pressure 3=21451
 N_2 -H mixtures, compressibility and 2nd virial coeff. 3=14192
 N_2 - N_2 ionization collisions meas. 3=4015
 $N_2^{0,+}$, 2nd positive system, Einstein A coeff., oscillator and abs. band strengths 3=22546
 N_2^+ band spectra 3=10503
 N_2^+ , first negative band intensity behind shock waves rel. to pres. 3=4756
 N_2^+ , formation in presence of He 3=10514
 N_2^+ spectra 3=4755
 N_2^+ , u.v. excited, fluorescence 3=4753
 N_2^+ , absorption spectrum in solution 3=21377
 N_2^+ , SCF wave-functions 3=25110
 N_2^+ , formation and stability 3=4004

Nitrogen compounds

- ammonium fluoberyllate, dielec. domain structure detect. 3=25401
 ammonium halides, sublimation rates 3=1874
 ammonium, metallic, density, 20×10^4 atmospheres 3=21100
 ammonium perchlorate, granular, columns, sound velocity 3=20091
 ammonium salts as moderators for cold neutron sources 3=6010
 ammonium salts, ferroelectric, H^1 and F^{19} spin-lattice relax. 3=23251
 azide, aqueous solns., radiolysis 3=16181
 azides, photolysis of aqueous solns. 3=6922
 chemical reaction $O + NO_2 = NO + O_2$, via NO_3 , isotope exchange 3=18436
 clathrate, β -quinol, N_2 motion, 15°-100° K, from heat capacity 3=8284

Nitrogen compounds — contd

- difluorodiazine, heats of formation of isomers 3=8960
 hydrazine mol., internal motion 3=10509
 hydrazoic acid, luminescence 3=12876
 metal ammonia solutions, electron spin relaxation and diffusion 3=21414
 molecular refractivities 3=15332
 nitrates, binary mixtures, liquidus curves 3=21618-20
 nitrates, inorg., lattice frequ. and rotational barriers 3=746
 nitro group, mag. anisotropy study 3=12856
 thiocyanate complexes, vibn. spectrum, structure 3=3012
 CIN_2 , i.r. spectrum 3=17585
 HN_3 , gaseous, propagation of detonation waves 3=3850
 HN_3 , photolysis in solid CO_2 , i.r. spectra 3=3402
 HNO_2 , i.r. photochem. isomerization 3=16159
 $HNO_2 \rightleftharpoons NO + NO_2 + H_2O$, vapour-phase equilibrium 3=25813
 ND_2CN , in-plane vibrations 3=22570
 $N^{14}D_3$, inversion line $J = 6$, $K = 6$, hyperfine structure 3=2633
 ND_3 , mols., Urey-Bradley force field, and thermodynamic props. 3=12799
 ND_3 , vibr. relax., by u.s. velocity dispersion 3=22567
 NF_2H (difluoramine), i.r. spectrum 3=8275
 NF_2H (difluoramine), microwave spectrum and structure 3=8274
 cis- N_2F_2 , microwave spectrum, structure and dipole moment 3=25111
 N_2F_4 , Raman spectrum, vibr., and two molecular forms 3=22569
 $NHDCN$, in-plane vibrations 3=22570
 NH_2 radical, spin polarization effects 3=22568
 NH_2 , recombination in decomposition of NH_3 3=8308
 NH_2CN , in-plane vibrations 3=22570
 NH_2NH_2 : N_2 system, i.r. spectrum, matrix isolation 3=15346
 NH_2OH and NH_2OH-d_3 , freqs., from force consts. 3=4780
 NH beam maser, characteristics 3=12352
 NH_3 beam maser, oscill. freq. meas. 3=12353
 NH_3 -containing atmosphere, corrosion of Cu-Zn alloys 3=8953
 NH_3 , decomposition kinetics in shock tube 3=20026
 NH_3 , dielec. const., elec. moment and atomic polariz. 3=3838
 NH_3 , diffusion in diethyl ether 3=9492
 NH_3 , electronic calc., harmonic force consts; i.r. and u.v. spectra 3=2632
 NH_3 , electronic structure 3=22565
 NH_3 , equil. between vapour and liq. aqueous phases 3=21336
 NH_3 , force consts. and internuc. distances, one-centre calc. 3=22564
 NH_3 , in atmosphere. 3=25870
 NH_3 lines in Jupiter's atmos., anomalous inclination 3=11515
 NH_3 , liq., slow neutron scatt. 3=14140
 $N^{14}H_3$ maser, 3, 2 line, as freqn. standard 3=519
 NH , maser, Zeeman effect obs. 3=12354
 NH_3^+ mol. beam, resonance radiation 3=6443
 NH_3 mol. beams, directivity pattern 3=22615
 NH_3 , molecular force constants, crystalline, gaseous, liquid 3=22566
 NH_3 molecule, X-ray and electron diffraction 3=8220
 NH_3 molecules, electron-density distributions 3=17587
 NH_3 , mols., Urey-Bradley force field 3=12799
 NH_3 , n.m.r., J coupling theory 3=14790
 NH_3 , quantum-mech. theory, semiempirical 3=25112
 $N^{14}H_3$, refractive index in microwave region 3=21362
 NH_3 spectra, emission, excited by protons and H atoms 3=15338
 NH_3 , spectral $J = 3$, $K = 3$ line shape, rel. to pres. and microwave power, 23.86 Gc/s 3=3837
 NH_3 , spectrum meas. 3=4762
 NH_3 , Urey-Bradley force field 3=22552
 NH_3 , use of Gaussian functions in wavefunction calc. 3=19965
 NH_3 , vibr. relax., by u.s. velocity dispersion 3=22567
 NH_3^+ radical, h.f.s., mol. orbital calc. 3=15343
 NH_3 -Ni cyanide complexes, X-ray powder patterns 3=1406

Nitrogen compounds — contd

- NH_4^+ , electronic structure, Hartree-Fock approx. 3=10534
 NH_4 alum, reagent grade, purification 3=1265
 NH_4BeF_3 , crystal structure, atomic 3=20847
 $(\text{NH}_4)_2\text{BeF}_4$, F^{19} magnetic resonance 3=3194
 $(\text{NH}_4)_2\text{BeF}_4$, ferroelec. phase transition 3=17941
 $(\text{NH}_4)_2\text{BeF}_4$, ferroelectric phase transition, thermodynamics 3=15621
 $(\text{NH}_4)_2\text{BeF}_4$, lattice superlattice structure 3=16082
 $(\text{NH}_4)_2(\text{Cd})(\text{SO}_4)_3$; Mn^{2+} , e.s.r., temp. depend. 3=5043
 NH_4Cl aerosol, optical scatt. data 3=19024
 NH_4Cl , I \rightarrow II transitions, X-ray study 3=6810
 NH_4ClO_4 , crystal structure 3=8852
 NH_4ClO_4 , crystal structure, NH_4 ion orientation 3=8857
 $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$, electronic absorpt. spectrum 3=15671
 $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$, solution, magnetic susceptibility 3=146
 NH_4CuCl_3 , crystal structure 3=18314
 $(\text{NH}_4)_2\text{CuCl}_4 \cdot 2\text{H}_2\text{O}$, e.s.r. absorption 3=1185
 $(\text{NH}_4)_2\text{CuCl}_4 \cdot 2\text{H}_2\text{O}$, proton mag. res. rel. to electron distrib. 3=1208
 NH_4 fluoroberyllate, birefringence, temp. depend. 3=17981
 NH_4 dihydrogen phosphate, relaxation in extreme i.r. 3=17942
 $\text{NH}_4\text{H}_2\text{PO}_4$ (ADP), thermal expansion 24° – 134°C 3=25202
 $\text{NH}_4\text{H}_2\text{PO}_4$, optical harmonic generation 3=20453
 $\text{NH}_4\text{H}_2\text{PO}_4$, optical harmonic generation, continuous using gas, laser 3=21506
 $(\text{NH}_4)_2\text{H}_2\text{PO}_4$, thermally dehydrated, Raman spectra and structure 3=15695
 $(\text{NH}_4)_2\text{H}_2\text{P}_2\text{O}_8$, γ -irrad., e.s.r. of defects 3=13022
 $(\text{NH}_4)_2\text{HPO}_4$, irrad., paramag. fragment 3=11117
 NH_4HSO_4 , specific heat, and ferroelec. transform., -2.55°C 3=20101
 NH_4 halide phosphors, crystal structure and luminescence 3=23100
 NH_4 halide phosphors, Ti^+ , Sn^{2+} activated 3=946
 NH_4 halides, lattice vibrations by neutron scatt. 3=750
 $\text{NH}_4\text{K}_2\text{I}_4 \cdot x$, rotation of NH_4^+ meas. 3=15418
 NH_4NO_3 , catalytic thermal decomposition 3=3398
 NH_4NO_3 , decomposition, thermal, isotopic tracer study 3=20988
 NH_4PF_6 , PF_6 e.s.r., rel. to γ -irrad. 3=20652
 NH_4PF_6 , rotation of NH_4^+ meas. 3=15418
 NH_4PF_6 , specific heat and phase transitions 3=12927
 $(\text{NH}_4)_2\text{SO}_4$, birefringence, temp. depend. 3=17981
 $(\text{NH}_4)_2\text{SO}_4$, elec. cond. and transition, -72° to 200°C 3=20382
 $(\text{NH}_4)_2\text{S}_2\text{O}_8$, rotation of NH_4^+ meas. 3=15418
 $\text{NH}_4\text{SO}_3\text{F}$, rotation of NH_4^+ 3=15418
 N_2H_4 , spectrum meas. 3=4762
 $\text{N}_2\text{H}_6\text{Cl}_2$, elastic and thermoelastic props. 3=18161
 N oxides, trace gases in atmosphere. 3=25870
 NO , absolute intensity of 5μ fundamental 3=15339
 NO , afterglow, intensity and decay rate 3=24245
 NO band emission in shock heated air 3=3836
 NO , β , γ , δ and Ogawa band excitation 3=8264
 NO , charge transfer cross-sections 3=14530
 NO , dissociation and vibr. rates meas. 3=7274
 NO , energy transfer in fluorescence 3=8265
 NO , fluorescence, lifetime of $\text{A}^2\Sigma^+$ state 3=23936
 NO , fluorescence, vibr. energy transfer between $\text{NOA}^2\Sigma^+(v=3,2,1)$ and $\text{N}_2\text{X}^1\Sigma_g^+(v=0)$ 3=23937
 NO , γ_{aa} absorption band, use in temp. meas. 3=10516
 NO , γ -bands at 2000°K , absorpt. 3=2606
 NO , photoionization 3=5622
 NO , photo-ionization efficiency curves, 9–14 eV 3=24211
 NO spark-produced in air, rel. to breakdown voltage 3=4100
 NO , spectra, visible and i.r., Rydberg series 3=10518
 NO spectrum and energy levels 3=10517
 NO , spectrum 1.2– 3μ 3=24023
 NO vapour, saturated, thermal capacity 3=11833
 NO , vibrational relax., meas. and theory 3=6394
 $\text{N}-\text{O}$, thermal conds. 3=21443
 NO^+ , charge transfer with atomic O 3=14531
 NO^+ , formation in ion-molecule reactions 3=23539
 NOBr , i.r. spectra, environmental effects 3=8599
 NOCl , i.r. spectra, environmental effects 3=8599
 NO_x , ionization potential meas. from ethyl nitrate 3=4014

Nitrogen compounds — contd

- NO_2 ionization potential by photoelectron energy spectra 3=7434
 NO_2 , mol. structure det. from moments of inertia 3=2597
 NO_2 mol., thermal emission and electronic levels 3=726
 NO_2 mols., electronically excited, dissociation 3=12872
 NO_2 mols., upper electronic level, oscillator strength 3=19994
 NO_2 , photolysis 3=18456
 NO_2^{16} , photolysis, 4047 Å, temp. var. 3=25833
 NO_2 , in planet Mars, atmosphere, and blue haze 3=18598
 NO_2^+ , SCF wave-functions 3=25110
 NO_2Cl molecule, thermodyn. props. 3=12797
 NO_2F molecule, thermodyn. props. 3=12797
 NO_2 radical, trapped, structure and spectra 3=6418
 NO_3 , structure 3=13598
 N_2O , abundance in ground level air 3=13664
 N_2O prodn. in liquid N_2-O_3 , u.v. photolysis 3=3408
 N_2O , pure rotational absorption lines 3=24019
 N_2O , sorption on NiO , MgO , neutron irradiated 3=13604
 N_2O , spectrum, i.r. band excited by active N 3=25108
 N_2O , spectrum 1.2– 3μ 3=24023
 N_2O , total absorptance near 4.5μ 3=14217
 $\text{N}_2^{14}\text{O}^{16}$, vibr.-rot. bands at $4-5\mu$ 3=6404
 $\text{N}_2\text{O}-\text{NO}$, N isotope exchanges 3=13592
 N_2O_4 , gas-phase dissociation 3=2666
 N_2O_4 , rate of dissociation meas. by u.s. absorption 3=4784
 NS , $\text{B}^2\Pi-\text{X}^2\Pi$ system, vibr. analysis 3=12825
 NS , spectrum, new $^2\Pi-\text{X}^2\Pi$ band system 3=12826
 NSF , microwave spectrum and structure 3=22563
 ONF , n.m.r., F^{19} chemical shift 3=10540

Nobelium

No entries this year

Noise

- ferromagnet, Barkhausen noise intensity rel. to stress heat treatment and structure 3=3104
photon, in photographs, and informational assessment 3=14389
random, intensity fluctuations, in N-dim. space 3=11706
statistical properties 3=11871

acoustic

- aerodynamic, from use of pressure quadrupoles 3=18946
aerodynamic, use of pressure quadrupole 3=9570
ambient, in coastal lagoon. 3=25863
analysis, bandpass filter error 3=227
automobiles, instruments and techniques 3=14292
from boundary layer turbulence 3=14290
cavitation bursts invest. 3=5421
cross-correl., effect on signal detection 3=9556
d.c. electric arc, hissing 3=16918
flame, turbulent, gasoline, Primus 3=11872
flames, open and turbulent 3=14289
flow, water, in plastic tubes 3=5505
frequency analysis of random short-duration noise 3=14285
generation by siren, wide-band noise 3=9569
impact-noise meas., tapping machine standard 3=23989
interaural correlation in hearing 3=3677
jet aircraft, spectra and directivity 3=11873
Knudsen spectra in ocean, origin 3=16201
machinery, sound-power output versus sound pressure level 3=7298
masking of tones, for cat's hearing 3=9301
microphone meas., effect of vibration response 3=14282
in ocean, models, spatial-correl. functions 3=3445
in ocean, spectra and sources 3=6951
reduction circuit to extract speech intelligence 3=9289
rockets, large, launching 3=16438
in ships, speech-interference 3=25996
sonic boom (supersonic bang) from aircraft, review. 3=221
speech interference, rating methods 3=25997
from supersonic flight, near a caustic 3=14245
from turbulence convected at high speed 3=11861
water, falling 3=21503
white noise, onset discrimination 3=13956
wind, in trees 3=21503
windows, response to random noise 3=16721

electrical

See Cosmic radiations, radiofrequency; Fluctuations, electrical; Sun, radiation, radiofrequency.

Noise abatement

See also Absorption, acoustic waves.
 automobiles, instruments and techniques 3=14292
 of centrifugal blowers 3=14288
 ear-protecting devices 3=16453
 industrial plant 3=14291
 porous materials for sound absorpt. 3=23983
 by trees, deciduous and evergreen 3=18926
 vibration control by resilient mounts 3=14231

Nomenclature and symbols

See also Units.
 clouds, relation to mechanisms 3=21039
 colour centres, V, ion signs in proper site 3=20249
 "dynamation" for "time rate of change of momentum" 3=3775
 earth, magnetic field, micropulsations 3=25953
 magnetic field, earth 3=16294
 physical equations, units, dimensions, philosophical aspects 3=13985

Nomograms

See also Graphs.
 for structure factor amplitudes calc. 3=8830

Novae

See also Stars.
 forty, coordinates meas. 3=9230
 models, spherically symmetric 3=9229
 outburst, causes 3=3586
 supernova envelope, nuclear synthesis in
 A = 20-40 3=21123
 supernovae, Fe-group elements synthesis 3=24941
 supernovae, fusion of fission fragments 3=6318
 supernovae, radio wave emission 3=11587
 supernovae theory, from shock wave theory 3=11559
 supernovae, type II, remnants, association with H
 emission stars 3=9242 α

Nuclear decay schemes

See Radioactivity, decay schemes.

Nuclear decay theory

See also Beta decay theory; Nucleus, theory.
 α -decay, electron ejection, review 3=15156
 α -decay, electron shell excitation process 3=4607
 α -decay, penetrability rel. to nonlocal potential 3=17424
 α -decay rate, shell model calcs. near Pb^{208} , from Po^{212} 3=19806
 α -decay to rot. levels of non-axial nuclei 3=4587
 α -decay, spheroidal by deformed even-even nuclei 3=12617
 α -decay, supercond. model of nucleus 3=2398
 alpha-decay, rigorous treatment of approximations 3=24889
 angular correl., effect of mag. and elec. interact. 3=8025
 γ - γ ang. correl., mag. and inhomogeneous elec. fields, interaction operator 3=15133
 γ - γ ang. correl., mag. and inhomogeneous elec. fields 3=15132
 gamma-ray internal conversion, K-shell 3=22318
 γ -rays, projection operator formalism 3=22362
 heavy nuclei, α -transitions, by energy surface intersection 3=10235
 L forbidden transitions near deformed region 3=22316
 "neutronization" kinetics at super-high densities 3=6149
 reactions, heavy ion, n evaporation 3=17499
 two-proton decay, review 3=10281
 Po isotopes, reduced derivative width δ_L^1 3=10317

Nuclear emulsions

See Nuclear track emulsions.

Nuclear excitation

See also Mössbauer effect; Nucleus, energy levels.
 by antineutrinos, low-energy, from reactor, possibilities 3=17244
 black nucleus, collective levels excitn. 3=2424
 charged particles, slow, theory including nuclear forces 3=22288
 collective nuclear states, by neutron inelastic scatt. 3=2465
 collective quadrupole-type, even nuclei, mag. dipole transitions 3=7981
 collective states, by charged particles, diffr. approx. 3=22290
 collective states, by proton scatt. 3=8100
 Coulomb, by 8-15 MeV Ne^{20} ions 3=6297

Nuclear excitation — contd

Coulomb excitation by N^{14} and Ne^{20} ions 3=10237
 Coulomb functions, exponential integrals, asymptotic expansions 3=12573
 Coulomb, rel. to cpd. nucleus formation 3=12572
 deformed nuclei, multiple Coulomb excitation 3=12574
 dipole, collective and shell model descripts. 3=6137
 dipole excitations, collective 3=7979
 dipole giant resonance, by inelastic electron scatt. 3=15181
 double Coulomb, in even nuclei 3=12577
 double-excitation by inelastic scatt., distorted-waves theory 3=661
 e scatt., E0 transitions, cross-sections 3=17454
 by electron scatt., inelastic, partial-wave analysis, quadrupole excitations 3=665
 electron scatt., inelastic, single-particle excit. 3=24858
 even—even nuclei, quadrupole collective excitations, dipole transitions 3=4585
 even—even, second 2^+ levels 3=6160
 g-factor meas. for short-lived states 3=634
 γ -rays, Compton scattered, possible use 3=24857
 by γ -rays from neutron capture, resonant scatt., 11 examples 3=6218
 heated nucleus, moments of inertia 3=15084
 heavy nuclei, optical potential 3=4611
 individual-particle states, by inelastic electron scatt. 3=10240
 intrinsic, even—even nuclei 3=10246
 isomer prod. by X-rays, irradi. conditions 3=8067
 light nuclei, levels, "packing" near threshold 3=22289
 M1 transitions, strong, in light nuclei 3=12578
 monopole, by relativistic electrons scatt. 3=12657
 Mössbauer effect, impurity nuclei, temp. Green functions 3=25173
 mutual or double transfer, semi-classical 3=22355
 by n, spherical nuclei surface, collective interaction 3=24943
 neutron strength function, by shell model 3=22259
 neutron widths calc. 3=19760
 non-spherical nuclei, collective 3=10238
 3-phonon vib. states by inelastic α -particle scatt. 3=22286
 by proton scatt., 3^- octupoles 3=19764
 quadrupole, by electron inelastic scatt., partial-wave analysis 3=665
 by scattering, inelastic, charged particles, collective, review 3=22287
 stable nuclides excited by bremsstrahlung 3=24856
 Al, dipole giant resonance, by inelastic electron scatt. 3=15181
 Al^{25} , 450 keV level, by $Mg^{24}(p,\gamma)$ 825 keV reson. 3=22296
 Al^{26} , 418 keV level, by $Mg^{25}(p,\gamma)$ 1 MeV 3=22296
 Al^{27} , by 2.76 MeV neutrons 3=15207
 Al^{27} , 2.21 MeV level, by bremsstrahlung of 2.85 MeV electrons 3=22297
 $B^{10,11}$, by electron scattering 3=4625
 B^{11} from $C^{12}(p,2p)$ and $C^{12}(\pi^-, n)$ reacts. 3=6277
 Be^7 , by He^3-He^4 scatt. meas. 3=12522
 Be^8 , α -emitting states ~ 20 MeV 3=678
 Be^8 , intermed. nucleus in $C^{12}(\alpha,4\alpha)$ reaction 3=2495
 Be^9 , by electron scatt., E1, E2 transitions 3=12580
 Be^9 , by electron scattering 3=4625
 Be^9 , by 17-49 MeV electrons 3=4628
 Bi^{209} , by 183-600 MeV electrons 3=10333
 C, dipole giant resonance, by inelastic electron scatt. 3=15181
 C, by 14 MeV neutrons, $n^1-\gamma$ ang. correl. 3=24944
 C^{12} , by α -particles, 22-24 MeV 3=2495
 C^{12} , by electron scattering 3=4625
 C^{12} , 15.1 MeV level, by photons 3=24919
 C^{12} , by inelastic electron scatt., calc. 3=24858
 C^{12} , by neutron scattering 3=12685
 C^{12} , by 182 MeV protons, impulse approx. 3=15184
 C^{12} , 7.65 MeV level, by 14 MeV neutrons 3=15206
 C^{12} , by 660 MeV protons 3=4630
 $C^{12}-C^{13}$ inelastic scatt., 126 MeV 3=15101
 $Ca^{40}(p,p'\gamma)$, at 150 MeV 3=10342
 Cd^{111m} , by γ -rays 3=15111

Nuclear excitation — contd

- Cr^{50,53,54}, by 6.9 MeV protons 3=22373
 Cu⁶³, by 183-600 MeV electrons 3=10333
 Dy^{156,158}, deformation parameters 3=15282
 Dy¹⁶², by O ions, double Coulomb effect 3=8134
 Er¹⁷⁰, by O ions, double Coulomb effect 3=8134
 Eu^{147,148,151}, 1-forbiddenness rel. to collective motion 3=6175
 F¹⁸, resonance, from first excited states 3=6164
 Fe^{56,58}, collective "2-phonon" levels, by α scatt., 44 MeV 3=24864
 Gd¹⁴⁰, by O ions, double Coulomb effect 3=8134
 Hf¹⁸⁰, by O ions, double Coulomb effect 3=8134
 Hg¹⁹⁰, 412 keV level, nuc. reson. fluoresc. 3=19796
 Ho¹⁶⁵, by 60 MeV O¹⁶ ions 3=15120
 In¹¹⁵, by 183-600 MeV electrons 3=10333
 In^{115m}, by γ -rays 3=15111
 K⁴¹, by A⁴⁰(p, γ), 70 levels 3=7991
 Kr, dipole giant resonance, by inelastic electron scatt. 3=15181
 Li⁶, by e scatt. 3=22368
 Li⁶(d,n)Be⁷, ground and 1st excited state 3=15225
 Li⁷, by antineutrinos, low-energy, calc. 3=17244
 Li⁷, by electron scatt. 3=19766
 Li⁷, inelastic electron scatt. 3=10240
 Mg²⁴, unnatural parity state, by α 's, 22.5 MeV 3=15229
 Mn⁵⁵, resonance, from first excited states 3=6164
 N¹⁴, by electron scattering 3=4625
 Ne²⁰, by inelastic scatt. of protons 3=4632
 Ne²⁰(p,p' γ), 4.97 MeV level 3=10255
 Ne²¹, by inelastic scatt. of protons 3=4632
 Ni^{58,60}, quadrupole, form factors 3=8081
 Ni^{58,60,62}, collective, by α -particles 3=15106
 Ni^{62,64}, collective "2-phonon" levels, by α scatt., 44 MeV 3=24864
 Ni⁶⁴, by 9.6-11.7 MeV protons 3=10259
 O⁸, by electron scattering 3=4625
 O⁸, by electrons 3=19836
 O⁸, by electrons, possible E1 overtones 3=4627
 O¹⁶, inelastic proton scatt. 3=2451
 O¹⁶, two-particle excitation of low states 3=15104
 O¹⁶, inelastic electron scatt. 3=10240
 O¹⁶, transition probability 3=10331
 O⁺ states of even-even nuclei by β decay 3=22322
 Pb²⁰⁸⁻⁸, by protons, configuration mixing 3=8020
 Pb²⁰⁸, by 183-600 MeV electrons 3=10333
 Si²⁸, by electron scattering 3=4625
 Si²⁸, unnatural parity state, by α 's, 22.5 MeV 3=15229
 Sm¹⁴⁷, Coulomb, gamma-ray spectra 3=19782
 Sm¹⁴⁹, 22 keV transition 3=6459
 Sm^{152,154}, by O ions, double Coulomb effect 3=8134
 Sn¹¹⁶, 1.27 MeV level 3=639
 Sn¹¹⁸, γ -ray resonance absorption spectra, 23.8 keV 2=2368
 Sr⁸⁸, quadrupole, form factors 3=8081
 Ta¹⁸¹, by 183-600 MeV electrons 3=10333
 Tb¹⁴⁸, from complex nuclei reactions 3=15119
 Tb¹⁵⁹, by 60 MeV O¹⁶ ions 3=15120
 Tc⁹⁸, Coulomb, gamma-ray spectra 3=19782
 Tm¹⁶⁸, by 60 MeV O¹⁶ ions 3=15120
 U²³², by Pa²³² β -decay 3=12604
 V⁵¹, by electron inelastic scatt., calc. and meas. 3=664
 W¹⁸⁴, by O ions, double Coulomb effect 3=8134
 W¹⁸⁴, residual levels, by neutron scatt. 3=22399
 Y⁸⁹(n,n' γ) 3=10363
 Yb¹⁷⁴, by O ions, double Coulomb effect 3=8134
 Zn^{64,66,68}, collective, by α -particles 3=15106
 Zn⁶⁴, by 9.6-11.7 MeV protons 3=10259
 Zr⁹⁰(n,n')Zr^{90m}, to 5 MeV 3=15208

Nuclear fission

- See also Nuclear reactors, fission
 asymmetric, model rel. to $Z = N = 50$ shells 3=2510
 asymmetry of external nucleons 3=6305
 chain reactions, mousetrap model 3=5316
 charged-drop model, deformation energy 3=19899
 charged-particle-induced, energy considerations 3=10398
 cluster model, mass distrib. calc. 3=687
 counter, for fission by thermal neutrons 3=4289
 criticality, interacting arrays of fissile materials 3=12705

Nuclear fission — contd

- criticality of unreflected air-spaced arrays of spheres 3=12706
 drop model, threshold and fragment energies rel. to Wigner symmetry energy 3=6306
 fission neutron energy and number rel. to fissioning nucleus props. 3=686
 fissionable units interact. safety calc. 3=8142
 heavy nuclei, fragment kinetic energy dispersion 3=15245
 instantaneous neutron emission rel. to nuclear shells 3=6308
 ionization chamber, small, U coated W wire in Ar at 15 atm. 3=17098
 isotopic and isotonic yields, theory 3=8141
 liquid drop model, rotating, fission barrier 3=10211
 mica, U-concentration meas. by fission tracks 3=21020
 quasistatic model, equilib. shapes of nuclei 3=6304
 rotating nucleus, energy surface, in liquid-drop model 3=15239
 spontaneous fission, after reaction of U²³⁸ with B¹¹, O¹⁸, Ne^{20,22} 3=24984
 supernova envelope, proton capture process for A = 20-40 3=21123
 ternary, U²³⁵, by slow n, 3-21eV 3=15241
 two types, rel. to nuclear charge distrib. 3=22432
 two types: symmetric and antisymmetric 3=2503
 Al and Al alloys, swelling after α -ray irradi. 3=4896
 Am²⁴¹, spontaneous fission half-life 3=4675
 Au, by 2.9 GeV protons, nuclear charge distrib. 3=8149
 Au¹⁹⁷, by C¹² and O¹⁶, kinetic energy release 3=15250
 Au¹⁹⁷, by He ions, mass-yield curves 3=10398
 Au¹⁹⁷, by heavy ions, ang. distrib. of fragments 3=10399
 Be⁹, in Coulomb field of heavy nuclei 3=24977
 Bi, by protons, 660 MeV; F¹⁸, Na²⁴, Mg²⁶, P³² yields 3=8150
 Bi, by protons, 156 MeV, ang. correl. 3=10400
 Bi, by protons, 20-22 GeV 3=8146
 Bi²⁰⁹, by C¹² and O¹⁶, kinetic energy release 3=15250
 Bi²⁰⁹, by heavy ions, ang. distrib. of fragments 3=10399
 Bi²⁰⁹, by 135 MeV protons, calc. 3=4638
 Cf²⁵², frequent meas. by double energy and double vol., comparison 3=24987
 Cf²⁵², spont. fission, prompt neutrons 3=10393
 Cf²⁵², spontaneous, neutron production rate 3=24988
 Cf²⁵⁴, spontaneous, mass and energy distrib. 3=24990
 Cm²⁴⁸, spontaneous, mass and energy distrib. 3=24990
 Cu, by protons, 660 MeV; Be⁷, F¹⁸, Na²⁴, P³² yields 3=8150
 Es²⁵³, spontaneous, mass and energy distrib. 3=24990
 Fm²⁵⁴, spontaneous, mass and energy distrib. 3=24990
 Fm²⁵⁴, spontaneous, mass and energy distrib. 3=24990
 Ho¹⁶⁵, by C¹² and O¹⁶, kinetic energy release 3=15250
 Ho¹⁶⁵, by O¹⁶ and Ne²⁰, effect of ang. momentum 3=6312
 In, by 2.9 GeV protons, nuclear charge distrib. 3=8149
 Lu¹⁷⁵, by C¹² and O¹⁶, kinetic energy release 3=15250
 Mg²⁴, into 2C¹², by 70 MeV bremsstrahlung 3=15247
 Ne²⁰, α -induced, ground-state transition 3=2507
 Np²³⁷, by neutrons, 10-22 MeV, cross-section 3=10395
 Np²³⁷, spontaneous fission half-life 3=4676
 Pb^{204,208}, by He ions, mass-yield curves 3=10398
 Pr¹⁴¹, by C¹² and O¹⁶, kinetic energy release 3=15250
 Pu²³⁹, η for vel. of 2200 m/sec 3=2504
 Pu²³⁹, and excitation functions 3=6184
 Pu²³⁹, by n, cross-section, 0.3-2.5 MeV 3=6309
 Pu²³⁹, by n time-of-flight, correction 3=17503
 Pu²³⁹, by thermal neutrons, time-of-flight studies 3=4677
 Pu²³⁹, triple fission, by neutrons, 0.05 to 0.7 eV 3=17505
 Pu²⁴⁰, by C¹² and O¹⁶, kinetic energy release 3=15250
 Pu²⁴⁰, neutrons emitted in symmetrical fission region 3=10401
 Pu²⁴⁰, symmetric, neutron emission numbers 3=17502
 Re¹⁸⁵, by C¹² and O¹⁶, effect of ang. momentum 3=6312
 Si²⁸, α -induced, search for 3=2508
 Sn, by protons, 660 MeV; F¹⁸, Na²⁴ yields 3=8150
 Ta¹⁸¹, by O¹⁶ and Ne²⁰, effect of ang. momentum 3=6312
 Tb¹⁵⁹, by C¹² and O¹⁶, kinetic energy release 3=15250
 Th, by protons, 20-22 GeV 3=8146
 Th²³², by C¹² and O¹⁶, kinetic energy release 3=15250
 Th²³², deuteron induced, cross-sections 3=24993
 Th²³², by He⁴, product relative yields 3=688
 Th²³², by neutrons, 10-22 MeV, cross-section 3=10395
 Th²³² products, independent photofission yield, charge distrib. 3=19895

Nuclear fission — contd

- Th²³², by protons and deuterons, 3-12 MeV 3=24992
 Th²³², by 6-61 MeV γ -rays, ang. distrib. 3=24991
 Th²³², by transitions bet. μ -mesic atomic states 3=8145
 Tl to Pu, deuteron induced, fragment ang. distrib. 3=19898
 Tm¹⁶⁹, by C¹² and O¹⁶, effect of ang. momentum 3=6312
 Tm¹⁶⁹, by C¹² and O¹⁶, kinetic energy release 3=15250
 U, by 0.1-6.2 GeV protons, excitation functions and charge distrib. 3=8147
 U, by protons, 156 MeV, ang. correl. 3=10400
 U, by protons, 20-22 GeV 3=8146
 U, by 2.9 GeV protons, nuclear charge distrib. 3=8149
 U, irradiated, swelling under mech. restraint 3=12712
 U, irradiation growth rate eval. 3=6310
 U^{233,235,238}, deuteron induced, cross-sections 3=24993
 U²³³, and excitation functions 3=6184
 U²³³, He⁴ induced, frequent meas. by double energy and double vel., comparison 3=24987
 U^{233,235}, by n, cross-section, 0.3-2.5 MeV 3=6309
 U²³³, by n, epithermal, capture to fission ratios 3=22434
 U^{233,235}, by n time-of-flight, correction 3=17503
 U²³³, 1.7 to 57 eV neutrons, cross-sections 3=19892
 U^{233,235}, by thermal neutrons, time-of-flight studies 3=4677
 U²³³, triple fission probab. by resonance neutrons 3=2506
 U²³⁴, by fast neutrons, cross-section, fragment ang. distrib. 3=2505
 U²³⁴, neutrons emitted in symmetrical fission region 3=10401
 U²³⁴, symmetric, neutron emission numbers 3=17502
 U²³⁵, Cd ratio 3=22435
 U²³⁵, chamber, B¹⁰ shielded, energy response 3=690
 U²³⁵, cross-section between 0.03 and 60 eV 3=12709
 U²³⁵, and excitation functions 3=6184
 U²³⁵, γ -ray emission, time distrib. meas. 3=6307
 U²³⁵, investigation by product cathode sputtering in metals 3=8152
 U²³⁵, mass-99 product chain analysis 3=12708
 U²³⁵, by neutrons below 0.5 eV, mass yields 3=22437
 U²³⁵, by neutrons, effect of fragments structure 3=22436
 U²³⁵, by neutrons, emitted neutron spectra 3=6311
 U²³⁵, by neutrons at 14 MeV, product relative yields 3=688
 U²³⁵, by neutrons, symm. at resonances 3=15243
 U²³⁵, by neutrons, 10-22 MeV, cross-section 3=10395
 U²³⁵, by slow n, γ ang. distrib. 3=12711
 U²³⁵, slow neutron fission, prompt neutron energy and ang. distrib. 3=19893
 U²³⁵, symmetric, nuclear charge distribution 3=19894
 U²³⁵, by thermal neutrons, cluster model 3=687
 U²³⁵, by thermal neutrons, prompt neutron emission 3=17504
 U²³⁵, thermal, X-ray spectra 3=10394
 U^{235,238}, by transitions bet. μ -mesic atomic states 3=8145
 U²³⁵, Pu²³⁹ initial conversion ratio meas. 3=12710
 U²³⁶, product relative yields 3=688
 U²³⁸, by C¹² and O¹⁶, kinetic energy release 3=15250
 U²³⁸, by continuous spectrum photons ($E_{\gamma\text{max}} = 35$ MeV) and 14 MeV neutrons 3=8143
 U²³⁸, by 14 MeV neutrons, α -particle emission 3=8144
 U²³⁸, by 14 MeV neutrons, excitation curve 3=15244
 U²³⁸, 14 MeV neutrons, mean neutron no. emitted 3=22433
 U²³⁸, by 14.7 MeV neutrons, nuclear temp. det. 3=8104
 U²³⁸, by He⁴ and heavy ions, total cross-sections 3=689
 U²³⁸, by neutrons at 14.5 MeV, kinetic energy of fragments 3=6317
 U²³⁸, by neutrons, 10-22 MeV, cross-section 3=10395
 U²³⁸, by 0.5-6.2 GeV protons 3=8148
 U²³⁸, products, independent photofission yields, charge distrib. 3=19895
 U²³⁸, by protons and deuterons, 3-12 MeV 3=24992
 U²³⁸, by 6-61 MeV γ -rays, ang. distrib. 3=24991
 U²³⁸, spontaneous, prompt neutron no. 3=12707
 U²³⁸, by 23 MeV deuterons, kinetic energy release 3=10397
 in UAl₃, fragment damage, electron microscope examination 3=13015
 UO₂ films, energy spectrum of fragments 3=4678

products

- A = 121, most probable charge 3=19894
 absorption of humic acids 3=22439
 ang. correl., for U, Bi, Au, by protons, 156 MeV 3=10400

Nuclear fission — contd

products — contd

- angular anisotropy, rel. to heated nucleus moments of inertia 3=15084
 counter, corona 3=24546
 damage to Au films 3=22864
 damage to heat-sensitive crystal lattices 3=22857
 detection with Cherenkov counter 3=12738
 detection by semiconductor counters 3=24556
 detector using high-energy β -discrimination 3=10098
 detectors, semiconductor, multiplication phenomena, gold surface barrier 3=19509
 fragment kinetic energy and neutron yields rel. to nuc. structure 3=22436
 fragment meas., comparison of double-energy and double velocity techniques 3=24987
 fusion, giving elements near Pt, in explosions 3=6318
 handbook of props 3=2146
 heavy-ion accel. in Van de Graaff 3=21907
 loss from uranium-graphite fuel 3=12737
 primary, likeliest nuclear charge prediction 3=24994
 secondary neutrons per fission, from mass distrib. curves 3=12714
 semiconductor detector response to f fragments 3=12376
 sub-barrier fission, kinetic energy 3=15246
 track delineation inside large AgCl crystals 3=7754
 tracks in AgCl crystals 3=821
 tracks in PbI₂ 3=25306
 tracks, in UO₂ films 3=822
 unknown, Z \leq 100, from U²³⁸-Ne²², O¹⁶ 3=6315-16
 Au, by protons, 156 MeV, ang. correl. 3=10400
 Be⁷, from Al, Cu, Sb react. with protons, 660 MeV 3=8150
 Bi, by 660 MeV protons, ang. distrib. 3=4679
 Cd^{115m,g}, Ag^{118g}, from U + p, 8-60 MeV 3=22438
 Cf^{249,250,251}, fragment kinetic energies 3=19896
 Cf²⁵², fragment velocities, time-of-flight meas. 3=19897
 Cs¹³⁴, from U, isomeric state independent formation cross-section ratios 3=24995
 F¹⁹, from Cu, Sb, Sn, Bi reacts. with protons, 660 MeV 3=8150
 Mg²⁸, from Sb, Bi, reacts. with protons, 660 MeV 3=8150
 Na²⁴, from Cu, Sb, Sn, Bi reacts. with protons, 660 MeV 3=8150
 P³², from Cu, Sb, Bi reacts. with protons, 660 MeV 3=8150
 Rh¹⁰² in air, 1952-8, rel. to explosions 3=9058
 Si³¹, from Sb react. with protons, 660 MeV 3=8150
 Th²³² fragments, ang. anisotropy 3=6314
 U-fission alloys containing Tc, phase relns. 3=5130
 U fission by protons, product nuclear charge and formation cross-sections 3=15249
 U, particle tracks in mica, fossil 3=6948
 U, by 660 MeV protons, ang. distrib. 3=4679
 U ternary fission by neutrons, kin. energy of fragments 3=15240
 U²³³, β -decay of products, chain length 3=2510
 U²³⁵, fission neutrons spectra 3=12715
 U²³⁵ fragments, neutron emission 3=12713
 U²³⁵, mass-distribution and kinetics, thermal-neutron induced 3=6313
 U²³⁵, neutron-induced γ -quanta 3=15242
 U²³⁶, neutron no. emitted in symmetric fission region 3=2509
 U²³⁸, neutron yield for symmetrical fission 3=8151
 U²³⁸, activation measurements, background detm., in γ -coincidence technique 3=1397
 U²³⁸, photofission fragments, for E_{γ} (max) = 17.5, 30, 50 MeV 3=15248
 UO₂, condensation on C collectors 3=3935
 UO₂, inert gas release, abnormal kinetics 3=22441
 UO₂, volatile product emission meas. 3=22440
 Xe¹³³, diffusion from graphite 3=10427
 W¹⁸¹ in air, 1952-8, rel. to explosions 3=9058
 Zr⁹⁷, from U, exchange of hot ions, with ZrCl₄ 3=21006

Nuclear fission reactors

See Nuclear reactors, fission.

Nuclear forces

See also Field theory, quantum, meson field.
 average binding energy, states of SU3 group 3=10200
 bound states by pure repulsive forces 3=19562

Nuclear forces — contd

- construction, low-energy, rel to nucleon-nucleon problem 3=2348
- controlled review of recent work, Conference, Salzburg, Sept. 1961 3=384
- diffuseness, rel. to energy level densities 3=24834
- effective range theory, vel. depend. potls. 3=623
- exchange of electron-neutrino pair 3=15068
- excited state masses and charges in Fermi-Yang model 3=17224
- fixed nucleon model, isobaric states 3=17191
- interactions and coupling schemes 3=6123
- K-meson exchange and nucleon-nucleon potential 3=14974
- Mandelstam representation and Regge poles with absorptive energy-dependent potentials 3=2215
- modulus of real and imaginary potentials 3=6253
- odd-odd nuclei, neutron-proton interaction energy 3=2359
- optical potl., radial distrib. of imaginary part 3=12543
- p-He⁴, and scatt., 40 MeV 3=22256
- phenomenological, different, rel. to nuclear matter props. 3=6127
- potential bet. two nucleons, using Low eqn. 3=15069
- potential, effect of isobaric spin purity, heavy nuclei 3=10223
- potential, effect on collisions, neutron transfer 3=17448
- potential energy, oscillator shell model 3=10200
- potential, long-range 3=15070
- review 3=2
- spin-orbit interact., N-N scatt. 3=581
- spin-orbit interaction, spherical nuclei 3=15095
- square-mound-potential gas, neutron scatt. 3=7864
- tensor force, spin-orbit coupling, in Hartree-Fock theory 3=22254
- two-body interactn., Heisenberg compts. 3=621
- two-body problem, exactly soluble, with non-central forces 3=24664
- velocity depend. N-N force 3=17382
- velocity-dependent and hard-core potentials, relationship 3=2216
- Wigner coeffs. for SU₃ group, p-shell fractional parentage coeffs. 3=6124
- Yukawa potential, energy levels 3=3746
- Yukawa potentials superposition, bound state 3=6125
- Bi²¹⁰, tensor forces 3=24874
- Bi²¹⁰, tensor force effects 3=24875
- F¹⁸, residual pair forces 3=22257
- H³, binding, three-body force effects 3=22213
- He³, binding, three-body force effects 3=22213
- N-N potl. from shell-model doublet splittings 3=22258
- N-N triplet-even potls., singular type, phase shifts 3=22255
- O¹⁸, residual pair forces 3=22257

Nuclear fusion

- See also Nuclear reactors, fusion; Thermonuclear reactions.
- bibliography, annotated, for 1958-62 3=9766
- conference, Salzburg, (1961) 3=7494
- controlled, high energy ion injection 3=15270
- fission explosions, giving elements near Pt 3=6318
- hot plasma, gas insulation, theory and expt. 3=12198
- mirror machine, self-sustaining reactions, critical conditions 3=14601
- molecules, muonic, reaction rates calc. 3=12888
- review, Salzburg conference papers 3=15251-2

Nuclear induction

See Nuclear magnetic resonance and relaxation.

Nuclear interactions

See Collision processes; Field theory, quantum, interactions; Fundamental particles; Nuclear reactions; Scattering, particles.

Nuclear isomerism

- See also Nucleus, energy levels.
- excitation by X-rays, irradiation conditions 3=8067
- isomer prod., thermal neutron activation cross-sections 3=10361
- isomeric cross-section ratios in (n, γ) reactions 3=675
- neutron activation prod., isomeric yield ratio 3=6271
- probability, for statistical model of nucleus 3=24835

Nuclear isomerism — contd

- production from stable nuclides with bremsstrahlung 3=24856
- sepn. and enrichment method 3=2369
- Ge⁷¹, millisecond decay 3=15134
- P³⁰, 26.8 keV, shift from Mössbauer effect 3=19786
- In¹¹⁶, 2.16 sec, thermal neutron activation 3=15112
- Nb⁹⁹, millisecond decay 3=15134
- Pm¹⁴¹, millisecond decay 3=15134
- Sb¹²² 3=10263-4
- Th²³⁴, 24 day, decay 3=15158
- Y⁸⁸, millisecond decay 3=15134
- Yb¹⁷⁶, by n irradiation of Yb metal 3=4579

Nuclear magnetic resonance and relaxation

See also Molecules, nuclear coupling.

- A₂B₃ high-resolution, analysis 3=8301
- acetaldehyde, J coupling theory 3=14790
- alkali halides, anisotropy of spin-lattice relaxation time 3=25584
- alkali halides, spin-lattice relaxation rel. to temp. and lattice vibrational spectrum 3=23249
- alkyl ammonium salts in solution, unusual spin-spin couplings 3=21410
- Ampere Colloquium, Eindhoven (1962) 3=20629
- Ampere Colloquium, Leipzig (1961) 3=23198
- analogue computer for moments calculation 3=12334
- aniline, C¹³ resonance, steric inhibition of conjugation 3=10544
- antiferromagnetics, spin-lattice 3=18137
- aromatic free-radical solutions, nuclear-electron spin relax. and Overhauser polarization 3=23909
- benzene, C¹³ n.m.r. 3=22601
- benzene, spin-lattice relax. meas. 3=23912
- 1,2-benzanthracene, high-resolution 3=17614
- bis(cyclopentadienyl) Fe II and III ions, electron transfer 3=12866
- bonds, H, effect in organic cpds. containing π -electrons 3=15383
- β -brass, Cu^{63,65} lines 3=6765
- d-camphor, -138° to +18°C 3=20679
- carbon groups, spin-spin coupling rel. to electro-negativity 3=4783
- cetyl alcohol crystals, mol. rotation 3=15958
- chemical shifts in Cs and Rb halides, pressure dependence 3=8731
- cis and trans 1, 2-difluoroethylene, gas phase 3=15385
- clays, water between layers, rel. to temperature 3=23261
- conjugated fluorine cpds., chemical shifts, theory 3=8299
- corundum, electron-nucl. double reson. of Cu²⁺ 3=13300
- cross-relaxation in spin systems, quantum statistical theory 3=5372
- crystal structure investigation, review 3=13314
- crystals, double resonance, dispersion and absorption signal changes 3=20663
- crystals, noncubic or imperfect cubic, spin-lattice relax. 3=8721
- crystals, rel. to mag. anisotropy fields 3=3093
- crystals, saturation, from quantum eqn. density matrix 3=3191
- cyclobutanes proton spin-spin coupling const., relative sign 3=8296
- cyclohexyl derivatives 3=8297
- in demagnetized state in solids, expt. and theory 3=6760
- deuterons in heavy water, 2-quanta transitions 3=20668
- diamagnetic anisotropy effects of C-C and C-halogen bonds 3=17615
- 2, 3-dibromopropionic acid, proton resonance spectrum 60 Mc/s 3=736
- 1, 1-difluoroethylene 3=8298
- N,N-dimethylaniline, C¹³ resonance, steric inhibition of conjugation 3=10544
- 2,2'-dimethyldiphenyl ether; methyl and ring protons spin-spin interaction 3=2645
- disubstituted benzenes, high-resolution, analysis 3=8301
- disubstituted benzenes, proton resonance 3=4779
- double resonance in the rotating frame 3=6761
- double resonance, rel. to spin-spin coupling const. relative signs 3=21995
- double resonance, removal of residual splitting 3=21999
- double resonance of three-spin systems 3=2662

Nuclear magnetic resonance and relaxation — contd
 double resonance, spin temperature 3=20664
 double resonance, use of weak perturbing r.f. fields 3=2658
 dynamic polarization by thermal mixing between
 2 systems of spins 3=25581
 effects of strong elec. field on molecules 3=6419
 electric field effects, in crystals 3=20666
 electrolyte solutions, spin-lattice relaxation,
 theory 3=149
 electron coupling of nuclear spins 3=8385
 enhancement in 4-level system 3=22490
 ethane, liquid, proton spin-lattice relaxation 3=18835
 ethyl ammonium ion, double resonance 3=12864
 ethyl benzene, spin-lattice relax. meas. 3=23912
 ethyl phosphate, in earth's field 3=20021
 ethylvinylketone, proton mag. res. 3=2657
 ferro- and antiferromag. materials, relaxation,
 review 3=1198
 ferromag. alloys 3=8729
 ferromag. subs., spin-lattice relax. 3=6754
 ferromagnetic alloys, d-band structure 3=10622
 ferromagnetic materials, rel. to external magnetic
 field 3=23257
 ferromagnetic powders, rel. to domain character-
 izations 3=8672
 ferromagnetics, spin-lattice 3=18137
 ferromagnets, nuclear acoustic paramagnetic reson-
 ance 3=20592
 fluctuating field effects and ortho-para conversion 3=15379
 fluids, effect of molec. orientation in elec. field 3=14188
 fluorides, iron-series, hyperfine effects 3=15955
 fluorine nuclei, anisotropy of chemical
 shift 3=25590
 fluorobenzene, J coupling theory 3=14790
 fluorobenzene, spin-lattice relax. meas. 3=23912
 fluorobenzene, spin-rotation, resonance temp. var. 3=6421
 fluorocarbons, relative signs of F coupling consts. 3=15377
 free, in inhomogeneous mag. fields 3=21994
 free radical solutions, Overhauser effect and relaxation in
 weak fields 3=23910
 furan, high-resolution, analysis 3=8301
 gases, relax., rel. to intermol. forces 3=14222
 glycerol, glassy and crystalline, proton mag. spin
 relaxation 3=23250
 1-halonaphthalenes, external spin-orbit coupling in
 soln. 3=2608
 head, crossed-coil, r.f., u-mode balancing method 3=9960
 hydrate crystals, H₂O flip motion, first and second
 moments effect 3=23268
 hydrate crystals, structural information 3=8728
 hydrated Na tetraborate minerals 3=15963
 hydroxy-benzenes, proton chem. shifts 3=4781
 high resolution, by second r.f. appln. 3=20016
 ice, proton reson., rel. to lattice defects 3=10644
 indophenol, apparent molecular asymmetry 3=20003
 intermolecular dipole-dipole interact., contrib. 3=17616
 iodobenzene, C¹³ resonance 3=10543
 ionic crystals, spin-lattice relaxation 3=6758
 ionic crystals with paramag. atoms, relaxation, rel. to
 diffusion barrier 3=6764
 isopropyl cpds., types AⁿB, AⁿBX 3=10542
 Knight shift in metallic systems 3=8729
 Knight shift oscillations 3=20675
 line shape analysis by lattice harmonics 3=5047
 liquid with molecules having four spin- $\frac{1}{2}$ nuclei, calc. 3=147
 liquids and solids, spin interaction with the
 environment 3=25583
 liquids, anisotropic, with axial symmetry 3=5452
 liquids, diamag., mobile, spin-one-half relax. 3=23912
 liquids in weak flds, rel. to earth's fld. 3=21420
 liquids, principle, applications 3=14184
 liquids, relax., by spin-rotational interact. 3=18833
 liquids, relax., molecular shape effect 3=21405
 liquids, relax. of longitud. and transverse
 components 3=23914
 magnetic crystals, electron-nuclei interact. 3=15732
 magnetic materials, dynamic effects 3=23246
 magnetic materials near Curie temp., theory 3=23267
 magnetic materials, theory for large nuclei conc. 3=8726
 magnetic materials, rel. to local fields 3=3187

Nuclear magnetic resonance and relaxation — contd
 magnetic suscept. meas. technique 3=4241
 medium effects 3=12865
 metal powders at low temp., method 3=17066
 metals and alloys, rel. to electronic structure 3=23245
 metals, anomalous skin effect conditions 3=20673
 metals, diamag. shielding, on Bloch model 3=2750
 metals, localized mag. moments meas. 3=12908
 metals, nuclear acoustic resonance absorpt. 3=20088
 metals, single crystals 3=21997
 metals, spin-lattice, relax., electron-electron interact.
 effect 3=23266
 methane, liquid, impurity-controlled proton
 relaxation 3=7202
 methanes, substituted, chem. shift, rel. to C¹³-H,
 spin-spin coupling 3=20022
 methyl alcohol, J coupling theory 3=14790
 methyl anilines, C¹³ resonance, steric inhibition of
 conjugation 3=10544
 methyl benzoate, spin-lattice relax. meas. 3=23912
 methyl formamides, J coupling theory 3=14790
 methyl iodobenzenes, C¹³ resonance 3=10543
 methylnitrobenzenes, C¹³ resonance, steric inhibition
 of conjugation 3=10545
 methyl-N,N-dimethylaniline, C¹³ resonance steric
 inhibition of conjugation 3=10544
 methyl salicylate 3=8302
 methyl-substituted mols., rel. to hyperconjugation 3=739
 methylvinylketone, proton mag. res. 3=2657
 molecular motion in crystalline state, study of 3=13313
 molecular rotation in liquids, n.m.r. study 3=14143
 molecule, intensity from n equiv. protons 3=15382
 molecules, direct analysis of spectrum 3=15380
 molecules, fast-exchange width 3=22596
 molecules, spectra calc., "direct" method 3=15381
 molecules, structure determination 3=15376
 molecules, theory of chemical shifts 3=15375
 nitrobenzene 3=738
 nitrobenzene, C¹³ resonance, steric inhibition of
 conjugation 3=10545
 non-magnetic impurity in metal, effect of 3=8729
 non-metallic crystal, double resonance, nr.
 surface 3=18145
 nuclear polarization, "double effect" 3=3185
 nuclear spin diffusion, interruption by strains 3=3186
 nuclear spin relaxation by diffusion or hindered rotations,
 model 3=23248
 oils, 6 types studied 3=23913
 operator techniques in phenomenological
 treatment 3=11120
 in organic chemistry, techniques, survey 3=17065
 organo-phosphorus cpds. with n and iso-C₃A,
 groups 3=20669
 p, in liquid CH₄-Ar, diffusion effects 3=21412
 p, in liquid CH₄, diffusion effects 3=21412
 paradichlorobenzol crystals, n.q.r. signals 3=6769
 paramag. solns. 3=21413
 paramagnetic complexes in soln., proton reson. 3=14186
 in paramagnetic media, spin-lattice relax. 3=6763
 in paramagnetic media, theory 3=3190
 para-substituted fluorobenzenes, π -electron distrib.
 and F¹⁹ n.m.r. shielding 3=8300
 phenyl acetate, spin-lattice relax. meas. 3=23912
 polarization of protons and fluorine nuclei in
 polymers 3=25580
 polyethylene, effect of irradiation on internal motion 3=13546
 polyethylene terephthalate, films, resonance
 study 3=11124
 polymers, proton spin decoupling in structure
 studies 3=25158
 polymers, relaxation times 3=22592
 polypropylene, second moments rel. to structure 3=3200
 polystyrenes, in solns., p.m.r. 3=11812
 powders, line broadening by field inhomogeneities 3=5048
 principles and practice, use in study of solids,
 review 3=3189
 n-propyl compounds of Cd, Sn, Hg, Pb, 25 Mc/s, satellite
 line analysis 3=22598
 proton, in benzene, liquid, -1.3-80°C, spin lattice time,
 28Mc/s 3=11809

Nuclear magnetic resonance and relaxation — contd

- proton—proton spin coupling consts., relative sign detm. 3=21996
- protons, dynamic polarization, spin—lattice relaxation, in polystyrene 3=20672
- protons, in H₂O, in zeolites 3=5452
- protons, methyl, in diphenylethers, and mol. struct., correction 3=10546
- protons, in paramag. C in benzene, diffusion effects 3=21406
- pyridine-type bases complexed with paramag. Ni(II) and Co(II) acetylacetonates 3=25144
- 2-pyridenes, proton n.m.r., strong coupled AA'KL system 3=4780
- quinonemethide, apparent molecular asymmetry 3=20003
- r.f. fields, rotating reference frame model 3=3188
- rare earth alloys, 3 relax. mechanisms 3=18155
- rare earth intermetallic cpds rel. to cond. electron polarization 3=1202
- rare earth ions in crystals, Bloch equations for effective spin 3=20667
- rare-earth metals, hyperfine interactions 3=15954
- relative signs of nuclear spin coupling consts. 3=10548
- relaxation, in crystals, hindered rotations theory 3=23269
- relaxation in molecular liquids containing free radicals 3=21411
- relaxation, rel. to electronic spin correlation 3=5046
- review of principles and use in phys. chem. 3=25139
- Rochelle salt, double resonance 3=25593
- rotary saturation linewidth 3=20674
- rotating pair of nuclei, spin relaxation 3=15951
- rotating solids, rel. to spin diffusion 3=6762
- rotation of specimen, effect on spectrum 3=25584
- rubber, resonance study of molec. motion 3=11125
- 2nd-harmonic generation in low-field nuc. induction 3=24500
- second moments in crystals, vibrational corrections 3=25587
- self-diffusion meas., spin-echo techniques 3=24499
- semiquinone solutions, dynamic polarization 3=23908
- solids, correl. effect of Suhl—Nakamura interact. 3=20670
- solids, diamagnetic, structural and relax. effects 3=25585
- solids, fine structure due to quadrupole effect 3=25586
- solids, hindered molec. rotation determination 3=15417
- solids, one phonon—two spins process 3=23254
- solids, u.s. absorption saturation effects 3=25588
- spin interactions between magnetic ions or nuclei in metals 3=8652
- spin—lattice, due to local centres 3=20661
- spin-lattice relaxation in liquids, spheroidal molecules 3=16638
- spin resonance saturation, statistical theory 3=5378
- spin—spin coupling const., geminal, hyperconjugation effect 3=22520
- spin—spin relax. by translational diffusion 3=20662
- spin system with different Zeeman and dipole—dipole spin temperatures 3=23247
- spin temperature adiabatic variation by local field modulation 3=21998
- splittings due to molecular asymmetry 3=2660
- stilbenequinone, apparent molecular asymmetry 3=20003
- structural interpretation of fine-structure lines 3=8727-8
- superconductors, Knight shift 3=328
- Suhl—Nakamura interactions, dynamic effects 3=15956
- 1, 1, 4, 4-tetramethylcyclohexyl-cis-2, 6 diacetate, relative signs of geminal and vicinal coupling consts. 3=2663
- tetravinylsilicon, proton mag. res. 3=2657
- thiophene, high-resolution, analysis 3=8301
- toluene, methyl and ring protons, relax. 3=4282
- toluene, spin—lattice relax. meas. 3=23912
- transitions induced by r.f. field parallel to static field 3=17067
- transition-metal diborides 3=10541
- transition metal and rare earth ions, rel. to effective mag. flds. 3=977
- transition metals, nuc. mag. relaxation 3=25595
- triphenyl derivatives of group IV elements, ring proton shifts 3=16637
- trimethylacetic acid 3=13313

Nuclear magnetic resonance and relaxation — contd

- trimethylammonium ion in aq. soln., proton-transfer study, number of H₂O mols. involved 3=25812
- tris (1,10-phenanthroline) Fe II and III ions, electron transfer 3=12866
- tris (2,2'-dipyridyl)Os II and III ions, electron transfer 3=12866
- Tutton salts, K₂Zn(SO₄)₂·6H₂O and K₂Mg(SO₄)₂·6H₂O 3=8740
- twin-T bridge, signal-to-noise ratio 3=517
- two-quanta transitions, linewidths 3=20668
- ultrasonic stimulation, review 3=20665
- vinyl cpds, proton relaxation, rel. to polymerization 3=23545
- water, freezing, sorbed on Si gel, phase transformations, to -100°C 3=19069
- water in organic solvents, proton exchange rates 3=9449
- water in synthetic substances 3=6768
- water, in zeolite, calc. 3=11126
- water sorbed on Ca hydrosilicate 3=11127
- weakly coupled spectra, analysis 3=8302
- zeolites 3=23263
- zeolitic water, spin—lattice relaxation time 3=21415
- Al²⁷ in Al, analysis by lattice harmonics 3=5047
- Al²⁷ in feldspar 3=23263
- Al²⁷, in AlAl, Knight shift and line intensity 3=23270
- Al²⁷ in ruby, elec. induced 3=15962
- Al²⁷, in UAl₂, 4-300°K, Knight shift 3=3192
- Al²⁷ in UAl₃, Knight shift 3=8730
- Al thick foils, He temp. 3=20673
- Al—Zn alloys, ageing, crystal structure study 3=11295
- B, amorphous, α and β rhombohedral 3=20678
- B, in alkali borate glasses, var. composition 3=18147
- B¹¹ in borax 3=15963
- B¹¹, in metal hexaborides 3=20677
- B¹¹ in Na tetraborate hydrates 3=8739
- B¹¹ in tincalconite 3=15963
- B¹¹ resonance in rare-earth intermetallic cpds 3=1197
- BiPb liquid n.m.r. 3=21419
- Br^{79,81} in NaBr, CsBr solns. 3=14185
- C¹³ chem. shifts in conjugated molecules, theory 3=17557
- C¹³, 1,1,2,2-tetrabromoethane 3=22594
- C¹³ satellites in oxalyl fluoride and oxalyl chloride/fluoride 3=15374
- C¹³ splittings in F¹⁹ spectra of organofluorine compounds 3=12867
- C¹³, weak or masked signal, indirect detection 3=22594
- CF₂Cl₂, liq., spin—lattice relax. of F 3=21409
- CH₃CHF₂, n.m.r. and double resonance in gas phase 3=6420
- CH₂F₂, n.m.r. and double resonance in gas phase 3=6420
- CHF₃, proton resonance, medium effects 3=9517
- CHFCF₂, nuclear spin relaxation in liquids 3=7220
- (CH₃)₂NP group 3=4782
- (C₂H₅)₂NP group 3=4782
- (CH₃)₃PbH, protons, chem. shifts and spin—spin coupling 3=22602
- (CH₃)_nSnH_{4-n}, protons, chem. shifts and spin—spin coupling 3=22602
- (CH₃)₃Sn—Li⁺, protons, chem. shifts and spin—spin coupling 3=22602
- [C(NH₂)₃]⁺ in guanidine alum. sulphate hexahydrate, n.m.r. study 3=4941
- CaF₂, F¹⁹ in r.f. field, rotating frame model 3=3188
- Ca hydrosilicates, rel. to crystal structure 3=6767
- Ca hydroxide, rel. to crystal structure 3=6767
- CaSO₄·2H₂O 3=8728
- Cd^{111,113} in n- and p-type CdTe, chemical shift 3=3202
- (Ce, La)₂Mg₃(NO₃)₁₂·24H₂O, spin—lattice relax., depend on temp. 1.5-1.7°K, Ce 0.2-1% 3=20065
- Cl in CuCl₂·2H₂O, 1.3-4.24°K 3=20680
- Cl³⁵ and K³⁹ or ⁴¹ in KClO₃, double resonance 3=23265
- Cl³⁵, in paramag. FeCl₃, mag. field depend. 3=5049
- Co 3=23259
- Co and Co alloys rel. to ferromag. props. 3=1200
- Co, longitudinal, model and expt. 3=3197
- Co powder, due to nuclei in Bloch walls 3=3193
- Co⁵⁹ in f.c.c. Co metal 3=1198
- Co⁵⁹ in hexagonal and cubic Co, to 956° and 1157°K respect. 3=1199
- Co⁵⁹, teaching demonstration, by grid dip meter 3=6768
- Co⁵⁹, temp. depend. 25°-600°C 3=18150
- CoCl₂·2H₂O, proton structure 3=20853

Nuclear magnetic resonance and relaxation — contd

- CoCl₂ · 6H₂O, 0.07° to 2.28°K 3=1207
 CoCl₂ · 6H₂O; rel. to H₂O molec. orientation 3=1201
 CoF₂—ZnF₂, rel. to Néel temp. 3=1055
 Cr³⁺ spin—lattice relax. in Al₂O₃, effect of V³⁺ 3=15953
 Cr⁵³ in CrO₂, below 240°K 3=18149
 CrB, and quadrupole binding const. 3=20678
 Cu—Ni alloys, 1.4°K 3=15959
 D, in Ba(ClO₃)₂ · D₂O, quadrupole splitting 3=25589
 DPPH, relaxation in molecular liquids 3=21411
 DTBN, relaxation in molecular liquids 3=21411
 F, in liquid CF₄—Ar, diffusion effects 3=21412
 F, in liquid CF₄, diffusion effects 3=21412
 F resonances in gases 3=12865
 F¹⁹, C¹³ satellite spectra analysis 3=15386
 F¹⁹ in CaF₂, analysis by lattice harmonics 3=5047
 F¹⁹, in CaF₂: Sm³⁺, diffusion narrowing 2=23271
 F¹⁹ in ONF, chemical shift 3=10540
 F¹⁹, in MgF₂, polycrystalline, by spin echo 3=8732
 F¹⁹ in MnF₂ near Néel pt. 3=3195
 F¹⁹ in UF₆ 3=23256
 F¹⁹ in XeF₄, chemical shift 3=12868
 Fe, longitudinal, model and expt. 3=3197
 Fe powder, effect of external mag. field 3=1203
 Fe, powdered, Bloch wall suppression, study 3=15805
 Fe⁵⁷ in Co 3=23258
 Fe⁵⁷, in Fe₃O₄, temp. dependence 3=8734
 Fe⁵⁷, in Li ferrite and magnetite, temp. depend. 3=8733
 Fe⁵⁷, in ordered Fe₃LiO₈ 3=1204
 Fe⁵⁷ in rare earth Fe garnet 3=23260
 Fe⁵⁷ in rare-earth iron garnets 3=3196
 Fe⁵⁷ relaxation in YFe garnet 3=23252
 Fe, resonance up to 65 000 atm 3=11123
 FeCl₃ aq. soln. proton spin resonance freq. 3=2140
 Fe₃(PO₄)₂ · 8H₂O (vivianite) line splitting, 1°–77°K 3=1206
 Ga^{69,71} and As⁷⁵ in GaAs, linear Stark effect 3=8735
 Ga, liquid, quadrupole relaxation 3=23915
 GaAs, quadrupole splitting, rel. to electric field 3=23199
 Gd³⁺ perchlorate solutions, hydration geometry 3=18832
 Ge, rel. to cyclotron resonance saturation 3=17850
 GeH₄PH₃ and GeH₄AsH₃, proton resonance 3=12863
 H¹ and F¹⁹ spin—lattice relax. in ferroelectric ammonium salts 3=23251
 H-bond studies, association shift 3=25140
 H¹ in urea, analysis by lattice harmonics 3=5047
 H₂, chemical shift, 20 kg cm⁻², room temp., 60 Mc/s 3=10539
 H₂, liquid and solid, spin—lattice relaxation 3=23253
 H₂, gaseous, rel. to pressure 3=21451
 H₂ gas, spin—lattice relax. meas. 3=20023
 H₂—inert gas mixture, proton spin—lattice relax. 3=21450
 H₂—N₂ gas mixture, proton spin—lattice relax. 3=21450
 H₂—N₂ gaseous mixtures, rel. to pressure 3=21451
 HBr, liquid, proton spin relaxation 3=21408
 H—C¹³ spin-spin couplings, nonbonded, in subst. ethylenes 3=10547
 HCl, liq. and gas, proton spin—lattice relax. 3=11808
 HCl, liquid and gas, proton spin—lattice relax. 3=21416
 HCl, liquid, proton spin relaxation 3=21408
 HF, relaxation 3=22600
 HOH, second moment, calc. by averaging over fundamental oscillations 3=10538
 He³, adsorbed, low temps. 3=12020
 He³, adsorbed, 2°–4.2°K, extension 3=19091
 He³, gaseous, spin—lattice relaxation, 1°–4.2°K. 3=178
 He³, liquid, spin—lattice relax. meas. 3=19085
 He³, solid, α and β phases 3=5574
 Hg¹⁹⁹, chemical shifts in molecules 3=15378
 I¹²⁷ in NaI powder, axially stressed double-coil apparatus 3=7726
 InSn liquid 3=21419
 InTi liquid 3=21419
 InTi liquid n.m.r. 3=21419
 K₂C₂O₄ · H₂O 3=8728
 KBr, spin—lattice relax., temp. depend. 3=11118
 KBr, with 0.1% impurity-substituted, [100] field gradients 3=18152
 K₂CuCl₄ · 2H₂O, electron distrib. by proton res. line distrib. 3=1208
 KI, spin—lattice relax., temp. depend. 3=11118

Nuclear magnetic resonance and relaxation — contd

- KI with 0.1% impurity-substituted, [100] field gradients 3=18152
 KNiF₃, covalent orbitals study 3=12891
 LaB₆, and quadrupole binding const. 3=20678
 La—H system, La and H nuclei 3=20671
 Li, saturation at 10.7 Mc/s 3=8736
 Li A-centres in KCl and KBr, ENDOR study 3=25299
 LiAl, rel. to crystal structure 3=11122
 LiBr, spin—lattice relaxation due to translational diffusion 3=18143
 LiBr, spin—lattice relax., temp. depend. 3=11118
 LiCuCl₃ · 2H₂O, below 4.46°K rel. to antiferromagnetism 3=1205
 LiGa, rel. to crystal structure 3=11122
 LiIn, rel. to crystal structure 3=11122
 Li₂SO₄ · H₂O 3=8728
 Mg²⁺ solvation number in methanol, meas. 3=1685
 MgS₂O₃ · 6H₂O 3=25721
 MnCl₂ solns., relaxation 3=4282
 Mn cpds., ferromag., liquid nitrogen temp. 3=3198
 Mn⁵⁵ in α Mn, 1.5° to 4.2°K 3=15960
 Mn⁵⁵ in KMnF₃, nuclear—antiferromag. double resonance 3=25582
 Mn⁵⁵, in KMnF₃, rel. to antiferromag. resonance 3=15966
 Mn⁵⁵, in MnFe₂O₄ 3=15965
 Mn⁵⁵ in Mn₂N and Mn₂Ge, 3=15961
 MnF₂, spin—lattice, calc. 3=18137
 MnF₂—ZnF₂, rel. to Néel temp. 3=1055
 N¹⁴ relaxation by quadrupole interactions in molecular liquids 3=9482
 NH₃, J coupling theory 3=14790
 (NH₄)₂BeF₄; F¹⁹ resonance 3=3194
 (NH₄)₂CuCl₄ · 2H₂O, electron distrib. by proton res. line distrib. 3=1208
 NH₄ + NH₃ = NH₄⁺ + NH₃, exchange reaction, correlation time 3=13589
 Na in NaCl, relaxation, rel. to divalent impurity ions 3=23273
 Na²³ and Pb²⁰⁷ in Na₃Pb₄ 3=20676
 Na²³, in borax and tincalconite, sites meas. 3=25591
 Na²³ in feldspar 3=23263
 Na²³ in mixed Na halides, relaxation 3=8738
 Na²³, in NaBr solns. 3=14185
 Na²³, in Na halides, mag. screening 3=23272
 Na²³ in Na tetraborate hydrates 3=8739
 Na²³ in rochelle salt, quadrupole shifts, second order 3=25594
 Na₂CO₃ · NaHCO₃ · 2H₂O, rel. to proton positions 3=8859
 NaCl rel. to phonon scattering by impurities 3=10584
 NaCl, Na²³ in r.f. field, rotating frame model 3=3188
 NaF, spin—lattice relax., temp. depend. 3=11118
 NaI, spin—lattice relax., temp. depend. 3=11118
 Na—NH₃ solns., proton resonance 3=7222
 Na₂S₂O₈ · 2H₂O, proton resonance, rel. to crystal structure 3=8848
 NaTi, rel. to crystal structure 3=11122
 Nb—Zr solenoid, supercond., persistent current obs. 3=9685
 Nb⁹³ in Nb—Mo alloys, Knight shift 3=8737
 Ni, longitudinal, model and expt. 3=3197
 Ni, powdered, Bloch wall suppression, study 3=15805
 Ni⁶¹, in dilute Co—Ni alloys meas. 3=3199
 Ni⁶¹, in Fe—Ni alloys, rel. to hyperfine field 3=15967
 Ni⁶¹ in Ni powder, saturation behaviour 3=25592
 Ni⁶¹, powder, 77°K, room temp., and moment 3=17393
 NiF₂, enhancement in domain walls 3=18114
 No²³, absorption line intensity rel. to impurity concentration 3=2791
 O¹⁷ n.m.r. linewidths in org. molecules, rel. to quadrupole coupling const. 3=22599
 O¹⁷ shifts caused by Cr³⁺ in aq. solns. 3=9481
 O¹⁷, solvent effects and spin couplings 3=11810
 O¹⁷, in various liquids & solutions 3=148
 O¹⁷ in MgO 3=20682
 P, solid white, relaxation times 3=5050
 P³¹ and Li⁷, in LiMnPO₄, paramag. and anti-ferromag. 3=18151
 P³¹ in H₃PO₄, line broadening by paramag. ions 3=13316
 PCl₃, spin—lattice relax., rotat. sample 3=20683
 Pb, broadening in fine particles 3=20681

Nuclear magnetic resonance and relaxation—contd

- Pb²⁰⁷, chemical shifts in molecules 3=15378
 PbO-B₂O₃ glasses, structure 3=18148
 Pt¹⁹⁵ in powder, n.m.r. relax. and Knight shift, 20°-290°K 3=3201
 Pt¹⁹⁵ in Pt 3=23255
 Pt¹⁹⁵, in PtSn₃, Knight shift 3=5051
 Pt¹⁹⁵, in Pt, 24°-299°K meas. 3=13315
 Rb spin relaxation induced by H₂ and rare gases 3=4723
 RbBr, F-centres, ENDOR 3=15520
 RbCl, F-centres, ENDOR 3=15520
 SF₆, 2 centre-symmetrical triplets, at -60° and -90°C 3=17613
 Si, Raman spin-lattice relax. for shallow donors 3=11119
 SiH₃PH₂' and SiH₃AsH₂', proton resonance 3=12863
 SiH derivs., proton and F¹⁹ chem. shifts 3=22603
 Sn¹¹⁹ in metallic tin, n.m.r. 3=5052
 SnH₄, protons, chem. shifts and spin-spin coupling 3=22602
 SrTiO₃, phase transition study 3=8791
 Te¹²⁵ in n- and p-type CdTe, chemical shift 3=3202
 Th₃Al-H and -D, p.m.r. 3=20849
 TI²⁰⁵, chemical shifts in molecules 3=15378
 UF₆, polycrystalline 3=18153
 UO₂·2H₂O, proton resonance 3=3203
 V alloys with Ti, Cr, Tc, Knight shifts 3=3204
 V⁵¹ in Cr-V alloys, Knight shift, linewidth 3=8741
 V⁵¹, in V-Fe alloys, Knight shifts 3=23141
 VO⁺⁺ ions, n.m.r. in aqueous solutions 3=14187
 in XAl₃ cpds 3=8730
 Xe¹²⁹ in natural Xe, liq. and gas 3=16666
 Xe¹²⁹,¹³¹, relax. time rel. to xenon-gas density 3=23944
 Xe¹²⁹,¹³¹ relaxation times in gas 3=1734
 Xe¹²⁹, in solid and liq. Xe, meas. 3=18154
 Xe¹²⁹ in Xe gas, chemical shift 3=16667
 Xe¹²⁹ in XeOF₄, by second r.f. appln. 3=20016
 XeF₂, liquid, chemical shifts 3=17617
 XeF₄, chemical shifts and spin-spin coupling 3=17617
 XeF₄, F¹⁹ spectrum 3=15387
 XeF₆, liquid, chemical shifts 3=17617
 XeOF₄, chemical shifts and spin-spin coupling 3=17617
 YFe garnet, anisotropy 3=3205

measurement

- use of amplitude modulated r.f. field, verification 3=9962
 amplitude modulation prodn. of sidebands 3=19474
 analogue-to-digital convertor for pulsed expts. 3=24501
 autodyne method for NMR spectroscopy 3=24495
 balanced coil for greater sensitivity for solids 3=19470
 crystals, high-resoln., rotation technique 3=14791
 cryostat and sample coil for spin-echo spectrometer 3=14793
 double coil system of Fibreglass for axial stress 3=7726
 dual-purpose spectrometer 3=24494
 instrumentation, review of recent advances 3=14789
 J coupling, spin echo technique 3=14790
 liquids, diamagnetic, relaxation meas. 3=23912
 magnetic field inhomogeneities reduction 3=7727
 magnetic field meas. 3=5808
 microsecond pulse, for broad lines in solids 3=14792
 r.f. bridge for pulsed n.m.r. expts. 3=9961
 resonance techniques with susceptibility balances, signal-to-noise ratio 3=24497
 sources of error, analysis 3=17068
 spectrometer for all nuclei, frequency-swept, proton-stabilized 3=12332
 spectrometer stabilized by nuclear-spin oscillator 3=14794
 spectrometers, high-resoln., design 3=24498
 spectrometers, resolution detm. with methylchlorosilane 3=19471
 spectrometers, use of modulation techniques 3=4281
 transients in solids, zero time resolution 3=19472
 two-phase systems, relax., spin echo method 3=4282
 two-synthesizer nuclear spin decoupling 3=12333
 Varian HR60 spectrometer, spin echo attachment 3=9958

Nuclear matter

See Nucleus, theory; Quantum theory, many-particle systems.

Nuclear orientation

- polarization of protons and fluorine nuclei in polymers 3=25580
 polyethylenes, n irradi., protons polariz. 3=20064
 relaxation, statistical time, random space, interactions 3=22273
 Ce¹⁴¹, in Ce double nitrate, intermediate-state reorientation 3=25172
 (Ce, La), Mg₃(NO₃)₁₂·24H₂O, protons, 170 lines increase in 3700 Oe at 1.6°K 3=20065
 Co⁵⁷, in Ce double nitrate, intermediate-state reorientation 3=25172
 Co⁵⁸, K-capture, effects on nuc. alignment 3=17433
 Co⁵⁹ in X site of La₂Zn₃(NO₃)₁₂·24H₂O 3=8723
 Ne¹⁹, β-decay asymmetry and mag. moment 3=17427
 Sm¹⁴⁹, by mag. cooling, spin assignments of low-energy neutron resonances 3=2468
 Ta¹⁸¹, in Hf, from decay anisotropy, temp. var. 3=20069

Nuclear photoeffect

See Nuclear reactions, photons.

Nuclear physics

- digital data processing 3=5325
 encyclopaedia of nucl. energy 3=4285
 foil for, prod. of Ge and Hf samples 3=19501
 handbook 3=2146
 high-energy instrumentation, conference, Geneva, July 1962 3=527
 instrumentation, conference, Geneva (1961) 3=12363
 instruments symposium, Harwell, Sept. 1961 3=12364
 low-temperature aspect, conference, Kiev, Oct. 1961 3=24124
 multiparameter analysers, use 3=24187
 nuclear spectroscopy conference, Kiev (1963) 3=15090
 nuclear spectroscopy conference, Riga, Jan.-Feb. 1961 3=4286
 Rutherford Jubilee Conference 3=12362
 targets, low-temp., liquid hydrogen or deuterium 3=24531
 Varena school course (1961) 3=22027

Nuclear quadrupole resonance

- Ampere Colloquium, Eindhoven (1962) 3=20629
 Ampere Colloquium, Leipzig (1961) 3=23198
 δ-benzene hexachloride, bond angles, nucl. quadrupole resonance study 3=8872
 chloranil, temp. dependence of Zeeman effect 3=8743
 coaxial bridge, high-sensitivity 3=7724
 coupling constant of Cl isotopes and dipole moment of BrCl 3=25141
 coupling const., effects of intramolecular elec. fields in molecules 3=2659
 covalent-bond asymmetries from Zeeman-split NQR 3=8744
 crystals, rel. to elec. fields and elastic strains 3=3206
 cyclopropanes, chlorinated 3=25142
 detection, by crossing technique 3=12336
 1, 2-dichloroethane-d₄ 3=8745
 hexanediamine, coupling meas. 3=2656
 meas. at low temp., cryostat 3=24503
 monochloroacetonitrile, coupling meas. 3=2656
 4-picoline, coupling meas. 3=2656
 n-propyl chloride, gauche, quadrupole coupling constants 3=25130
 pyridine, coupling meas. 3=2656
 solids, temp. dependence of nuclear pure quadrupole relaxation 3=25598
 spectrometer, automatic 3=19469
 review 3=5031
 ruby, temp. dependence of Al quadrupole interaction 3=13317
 temp. and pres. depend., asymmetric crystals 3=25596
 use for temp. meas., apparatus 3=14401
 Ba¹³⁵,¹³⁷ in Ba(ClO₃)₂·H₂O 3=12336
 Cl³⁵ in Ba(ClO₃)₂·H₂O, Zeeman splitting 3=12336
 Cl³⁵ in CCl₃C(OH)₂C₂H₅, multiplet structure 3=15964
 Cl³⁵ in (PNCI₃)₃, Zeeman effect 3=23264
 Cl³⁵, in paradichlorobenzene, effect of ±1, 2 transitions on relaxation time 3=25597
 Cl₂, solid, Zeeman broadening 3=15411
 Cu, Cu nuclei near Ag and Zn impurities 3=13318
 Ga, liquid, relaxation process 3=23915
 GaAs, quadrupole spin transitions 3=8747
 I¹²⁷ in mercuric iodide, at high pressure 3=25596

Nuclear quadrupole resonance — contd

- N^{14} in solid N_2 , effects of N^{15} 3=8742
 N^{14} relaxation by quadrupole interactions in molecular liquids 3=9482
 $Sb^{121,123}$ in stibnite 3=11128
 $Sb^{121,123}$ in Sb metal at 4.2°K 3=8746
 $SbCl_3$, Sb^{121} resonance 3=15968

Nuclear reactions

- See also Chemical analysis, by nuclear reactions; Fallout; Nuclear excitation; Nuclear fission; Nuclear fusion; Nuclear spallation; Radioactivity; Thermo-nuclear reactions.
 $a + b \rightarrow c + d + e + \dots$, relativistic theory 3=4337
 α -particle stripping cross-sections 3=15236
angular correlations, emission from nuclei with large ang. mom. 3=4612
by nucleons, 100 GeV, secondary particles 3=10105
charge symmetry, evidence for 3=10379
charge symmetry test 3=15225
cluster stripping, theory 3=15167
Coulomb wave-functions, numerical tables 3=14924
complex-eigenvalue theory, one-level approx. 3=22357
complex-eigenvalue theory, two-level approx. 3=24917
compound nucleus formation time 3=6216
compound nucleus, γ -radiation 3=6217
Cr, electrolytic preparation of isotopic foils 3=24533
critical particle momentum for which nucleus does not recoil 3=22359
cross-section fluctuation widths at high energies 3=22354
cross-sections, probability distributions 3=24916
density of states functions for cross-sections 3=660
diffraction processes, inelastic, at high energies 3=15169
direct, amplitudes, complex singularities 3=15165
direct, ang. localization of reaction sites 3=8065
direct, cross-section near singularities 3=15163
direct, coupling potential, character 3=19885
direct, dispersion theory 3=4609
direct, interaction in initial and final states 3=15164
direct, interact. in initial and final states 3=22352
direct knock-out, distorted-wave Born calc. 3=24918
direct processes, vertex parts of amplitudes 3=2427
direct reactions, amplitude vertex parts, study on optical model basis 3=2422
Ericson cpd. nucleus theory 3=2473
evaporation model, analysis and fluctuations 3=12652
excitation, mutual or double transfer, semi-classical 3=22355
handbook 3=2146
heavy nuclei, optical potential 3=4611
heavy particle stripping, distorted wave theory 3=15168
high-energy with secondary particle isotropic ang. distrib. 3=2428
light nuclei, fast nucleons, "spectroscopic approach" 3=2440
low energy, Dalitz diagrams, generalized, for $A + a \rightarrow C^* \rightarrow b_1 + b_2 + b_3$ 3=8061
low-energy, resonance theories discussion 3=6215
mechanism of primary collision with nucleons in nucleus 3=24938
mechanisms, review of recent results 3=12647
meson prod., multiple, new quantum mechanism 3=10133
momentum transfer to target nucleus, meas. 3=8060
multinucleon transfer between complex nuclei 3=8066
nature, rel. to jet investigations 3=17364
nucleon-heavy nuclei, 10^{10} - 10^{14} eV, slow particle emission 3=8084
neutrino induced, in Be^9 3=19886
neutron transfer, nuclear potential shape effects 3=17448
non-relativistic graph technique for direct reactions 3=8059
nuclear recoil momenta, rel. to evap. processes 3=4638
optical model in the interior of the nucleus 3=2425
"parity-unfavoured", forward and backward "selection rule" 3=24637
pickup reactions, nucleon momentum distrib., optical potential effects 3=624
primary study inside cyclotron vacuum tank 3=10321
resonance levels, reduced widths theory 3=15194
resonance parameters, average, R-matrix theory 3=6213
review, historical account 3=2512
 $\Sigma\pm$, inelastic, summary of 3=8121

Nuclear reactions — contd

- single-channel, phase shift analysis, review 3=12650
spherical nuclei, stripping, pick-up, quasi-particle approx. 3=2372
spirality inversion 3=15166
statistical emission, theory 3=2426
stopping power, atomic, gas-vapour mixture, with temp. gradient 3=22046
stripping, knock-out amplitude ang. distrib., importance of interaction range 3=19827
stripping, and nuclear neutron single particle level determ. 3=19762
stripping and pickup, plane-wave approx. 3=4636
stripping reactions, reduced widths, polology appl. 3=6214
stripping, rel. to polarization 3=2
surface nucleons exchange 3=8057
target polarization effects 3=8062
target, Ag, Co, Cu 3=24532
threshold effects in average cross-sections, R-matrix theory 3=10320
ultra high energy, cosmic ray components, conference 3=12646
use to study nuclear structure, review 3=24915
widths, Porter-Thomas statist. analysis 3=4610
chemical effects
See also Chemical effects of radiations, ionizing radiations.
hexabromoethane, solid, Szilard-chalmers chem. 3=3412
(n, γ), atomic and ionic recoil 3=18458
Ag, colloidal, recoil products, separation 3=6929
 $C^{12}(\gamma,n)C^{11}$ recoil reactions in C_6 hydrocarbons 3=11359
 CH_3I^{125} and $C_2H_5I^{125}$ decay, formation of fragment ions 3=18459
 F^{18} labelling of fluoro-organic cpds. by $F^{19}(n,2n)$ 3=6928
 K_2CrO_4 , thermal neutron capture, compression annealing 3=25311
Nuclear reactions due to
alpha-rays
direct knock-out, distorted-wave Born calc. 3=24918
(α , d) stripping reaction for light nuclei 3=4566
(α , γ) at $(0.5-2.0) \times 10^{10}$ °K for A=40-60 3=24941
 α -N interact., separable potl. model 3=2332
 α , n, mixture of light and heavy (α emitting) nuclei giving spherical n source, calc. 3=22429
(α , p) differn. cross-section in large-angle region, variation 3=6244
(α , p), on light and medium-wt. nuclei, 22 MeV 3=19883
(α , t) in Zn and Cd 3=4637
(α , xn), meas. of following γ -rays 3=22428
(α , 2 α), 0.91 BeV, data on " α -particle" clusters in nuclei 3=17385
40 MeV, meas. rel. to optical model 3=19884
Ag, formation of Na^{24} and Mg^{28} , 320-880 MeV 3=22387
 Ag^{107} , excitation functions 3=10389
 $Ag(\alpha, p)$, at 30 MeV 3=4669
 $Al(\alpha, p)$, at 30 MeV 3=4669
 $Al^{27}(\alpha, p)Si^{30}$, 14.7 MeV 3=2500
Au, formation of Na^{24} and Mg^{28} , 320-880 MeV 3=22387
Au(α , p), at 30 MeV 3=4669
 $B^{11}(\alpha, p_n)C^{14}$, 2.5 to 5.0 MeV 3=19770
 $Be^9(\alpha, n)C^{12}$, energy distrib. meas. 3=17498
 $Be^9(\alpha, n\gamma)C^{12}$, 3.6-7.6 MeV 3=10391
 $Be^9(\alpha, n)C^{12}$, 17.5-22.1 MeV, ang. distrib. 3=10388
 $Be^9(\alpha, t)B^{10}$ 3=4609
 $Bi^{209}(\alpha, n)At^{212}$ 3=2419
 $Bi^{209}(\alpha, n)At^{212}$, 17-25 MeV 3=15157
C, scatt., elastic, and Regge poles 3=8130
 $C^{12}(\alpha, 4c)$ at 23 MeV 3=4671
 $C^{12}(\alpha, 4\alpha)$, reaction mechanism 3=2495
 $C^{12}(\alpha, n)O^{15}$, thresholds meas. 3=8131
 $C^{12}(\alpha, n)O^{15}$, 17.5-22.1 MeV, ang. distrib. 3=10388
 $C^{12}(\alpha, p)N^{15}$, < 35 MeV, p ang. distrib. peaks near 180° 3=17459
 C^{12} , scatt., 38 MeV, ang. distrib. 3=12699
 $C^{12}(\alpha, n\gamma)O^{16}$, excitation function 3=10390
 $Ca^{40}(\alpha, p)Sc^{43}$, up to 20 MeV 3=12700
 $Ca^{40}(\alpha, pn)Sc^{42m}$ 3=10257
 $Co^{59}(\alpha, Be^7)$ and (α , He^4He^3), 36-41 MeV 3=22383
Cu, formation of Na^{24} and Mg^{28} , 320-880 MeV 3=22387

Nuclear reactions due to —contd

alpha-rays —contd

- Cu⁶³(α ,np)Zn⁶⁵, compound nucleus decay, competition between γ and p emission calc. 3=15230
- Cu(α , p), at 30 MeV 3=4669
- F¹⁹(α ,p)Ne²², 10.3, 13.6, 14.7 MeV 3=10387
- F¹⁹(α ,p)Ne²², 14.7 MeV 3=2500
- F¹⁹(α , t)Ne²⁰, 18.5 MeV meas. 3=4670
- Fe⁵⁶(α , p)nCo^{58m}, 3=3884
- Gd(α ,xn)Dy, γ -rays from excited Dy 3=22428
- He³(α , γ)Be⁷, 0.42-5.80 MeV 3=24809
- He³(α , γ)Be⁷, direct-capture model 3=24810
- Li⁶(α , d), ang. distrib., 24.5, 23.7 MeV α 's 3=22427
- Li^{6,7}(α , p)Be^{9,10}, 13.6 and 14.7 MeV 3=2500
- Mg²⁴(α , γ)Si²⁸ 3=10219
- Mg²⁴(α , γ)Si²⁸ 3=24836
- Mg²⁴(γ , γ)Si²⁸, 1.2-3.2 MeV, resonances obs. 3=2499
- Mn⁵⁵(α , n)Co^{58m}, 3=684
- Ne²⁰(α , C¹²)C¹², cluster model 3=8133
- Ne²⁰(α , C¹²)C¹², 12-20 MeV 3=24975
- Ne²⁰(α , α')Ne²⁰, two new γ -emitting levels 3=2498
- Ne²⁰, scatt., 38 MeV, ang. distrib. 3=12699
- Ni(α , Be⁷), 33-41 MeV 3=22383
- O¹⁸(α , γ)Ne²⁰, in stars, and γ -ray width of 7.20 MeV Ne²⁰ level 3=11568
- Rb⁸⁵(α , 2n)Y^{87m}, 3=684
- S³²(α , n)Ar³⁵, thresholds meas. 3=8131
- S³⁴(α , n)Ar³⁷, thresholds meas. 3=8131
- Si²⁸(α , n)S³¹, thresholds meas. 3=8131
- T(α , γ)Li⁷, direct-capture model 3=24810
- U, formation of Na²⁴ and Mg²⁸, 320-880 MeV 3=22387
- V⁵¹(α , Be⁷) and (α , He⁴He³), 40 MeV 3=22383

cosmic rays

- cosmic rays, collision with H in space, radiosotopes produced 3=619
- jets, double max. ang. distrib., in photographic plates due to cosmic rays 3=5993
- ≥ 30 BeV, cosmic rays, in graphite, secondary multiplicity 3=17200
- in brass, electron-photon showers 3=6104
- with heavy nuclei, 10¹⁰-10¹⁴ eV, slow particle emission 3=8084
- Pb²⁰⁸(p, 2n)Bi²⁰⁶ in Discoverer 17 by solar protons 3=7951
- Pb²⁰⁸(p, 4n)Bi²⁰⁵ in Discoverer 17 by solar protons 3=7951
- Pb²⁰⁷(p, 3n)Bi²⁰⁶ in Discoverer 17 by solar protons 3=7951
- in Pb, electron-photon showers 3=6104

deuterons

See also Deuterons.

- activation cross-section survey and mechanisms 3=10382
- (d, He³) in d-s shell nuclei, rel. to structure 3=6128
- (d, n), effects of knock-out mode 3=8123
- (d, n), with (d, p), rel. to isobaric spin of target 3=677
- (d, p) and (d, t) studies of structure in 82-neutron region 3=2390
- (d, p), and nuclear neutron single particle level determ. 3=19762
- (d, p), effects of knock-out mode 3=8123
- (d, p), exchange effects magnitude 3=24965
- (d, p) for light nuclei, distorted-wave calcs. 3=17493
- (d, p) on 15 rare earth nuclides at 12 MeV, p spectra 3=22285
- (d, p) reactions, ang. distrib., distorted-wave calc. 3=2487
- (d, p) reactions with $l=0, 1$ orbital ang. momentum transfer, proton polarization 3=682-3
- (d, p) stripping and gross structure, in cyclotron of Ukrainian Acad. of Sciences 3=19880
- (d, p) stripping, p ang. distrib. and Si³⁰, Zr^{91,92}, Cd¹¹⁴ spin and parity 3=17405
- (d, t), and nuclear neutron hole state determ. 3=19762
- (d, t) in Al and Pb 3=4637
- (d, t) reactions filling 1f_{7/2} shell, seniority mixing 3=626
- deuteron splitting, in field of deformed nuclei 3=22426
- elastic scatt., 15 MeV, by 23 elements 3=15221
- in nuclear emulsions, 275 MeV, m.f.p. 3=24808
- polarization effects, with spin-orbital interaction 3=22353
- reduced width detm., from polarization effects 3=10378
- stripping, by S-matrix reduction techniques 3=15223
- stripping, charge asymmetry of deuteron 3=10380
- stripping in Coulomb field 3=6287

Nuclear reactions due to —contd

deuterons —contd

- stripping, proton spectra "gross structure" 3=6293
- stripping reactions, reduced nuclear-level widths 3=19765
- stripping, reduced widths, calculation 3=10205
- stripping theories and shell model 3=22356
- stripping theory below Coulomb barrier 3=22424
- 22-4 MeV total cross-sections 3=6292
- Al²⁷(d, He³)Mg²⁸, residual nucleus study 3=8125
- Al²⁷(d, p)Al²⁸, at 15 MeV, proton polarization 3=382
- Ar⁴⁰(d, α)Cl³⁸, excitation functions and thick-target yields 3=10385
- Ar⁴⁰(d, He³)Cl³⁹, excitation function 3=10384
- Au(d, np), n p ang. correls., and d dissociation 3=17491
- B¹⁰(d, α)Be⁸, differential cross-sections and ang. distrib. 3=19874
- B¹⁰(d, p)B¹¹, l -values 3=680
- B¹⁰(d, p)B¹¹, 13.8 MeV 3=15222
- B¹¹(d, n)C¹² and breakup reactions at 1.60-2.70 MeV 3=8126
- B¹¹(d, n)C^{12*}(γ -n) ang. correl. 3=15226
- B¹¹(d, n γ , ...)C¹², ang. correl. meas. 3=24967
- B¹¹(d, p)B¹² 3=4664
- Ba¹³⁸(d, p)Ba¹³⁹ 3=2360
- Ba¹³⁸(d, p)Ba¹³⁹, level study 3=2390
- Ba¹³⁸(d, t)Ba¹³⁷, level study 3=2390
- Be⁹(d, α)Li⁷, 13.6 MeV, α ang. distrib. 3=22425
- Be⁹(d, n)B¹⁰ 3=4609
- Be⁹(d, n)B¹⁰, 80 keV 3=2488
- Be⁹(d, p)Be¹⁰, 13.8 MeV 3=15222
- Bi²⁰⁹(d, p), data on Bi²¹⁰ levels 3=24876
- Bi²⁰⁹(d, p)Bi²¹⁰, at low energy, high-resolution study 3=681
- C¹²(d, α)B¹⁰, ang. distrib. 3=8124
- C¹²(d, α)B¹⁰, 15-20 MeV 3=22418
- C¹³(d, n)N¹³, n-polarization 3=4666
- C¹²(d, n)N¹³, 6.5 MeV, neutron polariz. 3=22417
- C¹²(d, n)N¹³, 13 MeV 3=10376
- C¹²(d, n)N¹³(g.s.), distorted-wave analysis 3=24968
- C¹³(d, p)C¹³ 3=4609
- C¹³(d, p)C¹³ 3=8128
- C¹²(d, p)C¹³, 0.8-1.2 MeV, proton polariz. 3=2490
- C¹³(d, p)C¹³, 5.5-12 MeV, polariz. and (d, p γ) correl. 3=22422
- C¹³(d, p)C¹³, excitation curves 3=17400
- C¹²(d, p γ), p- γ ang. correls. 3=679
- C¹²(d, p)C¹³, at 15 MeV, proton polarization 3=683
- C¹³(d, α)B¹¹, 3.35-4.2 MeV meas. 3=15227
- C¹³(d, n) and C¹³(d, p), 3.2-4.1 MeV, mechanism 3=24970
- C¹³(d, n)N¹⁴, 3.9 MeV differential cross-sections 3=6289
- C¹³(d, p)C¹⁴, 4.6-6.0 MeV, excitation functions 3=24969
- Ca⁴⁰(d, α)K³⁸, 5.46 MeV 3=10256
- Ca⁴⁰(d, n)Sc⁴¹, time-of-flight 3=17494
- Ca⁴⁰(d, p)Ca⁴¹, 13.8 MeV 3=15222
- Ca⁴⁰(d, p)Ca⁴¹, at 15 MeV, proton polarization 3=683
- and Ca⁴¹ spins, three levels, from (d, p) reactions, d, p, γ correl. 3=19777
- Cd¹¹¹(d, p)Cd¹¹², 13.6 MeV, and Cd¹¹² levels, spin and parity 3=12592
- Ce¹⁴⁰(d, p)Ce¹⁴¹, level study 3=2390
- Ce¹⁴⁰(d, t)Ce¹³⁹, level study 3=2390
- Ce¹⁴²(d, n), excitation functions up to 11.8 MeV 3=19879
- Ce¹⁴²(d, 2n), excitation functions up to 11.8 MeV 3=19879
- Ce¹⁴²(d, p), excitation functions up to 11.8 MeV 3=19879
- Co(d, n), neutron spectrum structure and polarization 3=24963
- Cr(d, p), stripping at 13.6 MeV 3=24972
- Cr^{50,52}(d, p)Cr^{51,53}, 13.6 MeV 3=19878
- Cr⁵²(d, p)Cr⁵³, DWBA, optical model parameters 3=4665
- Cu(d, n), neutron spectrum structure and polarization 3=24963
- Cu(d, np), n p ang. correls., and d dissociation 3=17491
- Cu⁶³(d, p) and (d, 2n), 3-11.6 MeV 3=22423
- Cu⁶⁵(d, p) and (d, 2n), 3-11.6 MeV 3=22423
- DD and DT, neutron output meas. by Si junction detector 3=2276
- D(d, n)He³, neutron polarization 3=24807
- D(d, n)He³, self-target in Au 3=12514
- Er(d, p) for various isotopes 3=10270
- F¹⁹(d, n)Ne²⁰, ang. distrib., 1-1.3 MeV 3=6288
- F¹⁹(d, p)F²⁰, heavy-particle stripping theory 3=15168

Nuclear reactions due to — contd

deuterons — contd

- $F^{19}(d,p)F^{20}$, 2 MeV, ang. distrib. 3=22419
 $Fe(d,n)$, neutron spectrum structure and polarization 3=24963
 $Fe^{55,58}(d,p)$, study of levels 3=24833
 $H^3(d,\gamma)He^3$, 150-1300 keV 3=17356
 $H^3(d,p)He^4$, analysis by complex-eigenvalue theory 3=22358
 $He^3(d,p)He^4$, analysis by complex-eigenvalue theory 3=22358
 $He^3(d,p)He^4$, stripping, at 27 MeV 3=15224
 $He^3(d,p)He^4$, 3-12 MeV, proton polariz. 3=15049
 $He^3(d,p)He^4$, ~2 MeV, proton polariz. 3=22220
 $La^{139}(d,p)La^{140}$ 3=2360
 $Li^6(d,\alpha)\alpha$, up to 5 MeV 3=678
 $Li^6(d,\alpha)\alpha$, 3-5 MeV 3=24966
 $Li^6(d,n)Be^7$ and $Li^6(d,p)Li^7$, relative yields 3=15225
 $Li^6(d,p)Li^7$, $Li^6(d,n)Be^7$, charge symmetry 3=10379
 $Li^6(d,p)Li^7$, 3-5 MeV 3=24966
 Li^7 , α -ray spectra due to breakup of Be^8 , 3=10383
 $Li^7(d,n)Be^7$, study using new fast n spectrometer 3=10130
 $Li^7(d,p)$, Li^8 polarization 3=24964
 $Mg^{24}(d,p)Mg^{25}$, at 15 MeV, proton polarization 3=683
 $MgO + d$, 9 MeV, Mg^{27} decay, γ - γ coincidence, absence of 0.84-0.81 MeV or 0.84-1.01 MeV cascades 3=24892
 $Mn^{55}(d,p)$ and $(d,2n)$, 3-11.6 MeV 3=22423
 $Mo^{92,94}(d,p)$, 13.6 MeV 3=22271
 $Mo^{97}(d,p)$, 13.6 MeV, ang. distrib. 3=24973
 $N^{14}(d,n)O^{15}$, stripping reaction 3=2486
 $N^{14}(d,n)O^{15}$, study using new fast n spectrometer 3=10130
 $N^{14}(d,n)O^{15}$, n yield for ds⁺ O-700 keV 3=15228
 $N^{15}(d,p)N^{16}$ 3=24862
 $Na^{23}(d,p)Na^{24}$ 3=19875
 $Ne^{20}(d,n\gamma)Na^{21}$, ang. correl. meas. 3=10377
 $Ne^{20}(d,n\gamma)Na^{21}$, first excited state of Na^{21} 3=2385
 $Ni(d,n)$, neutron spectrum structure and polarization 3=24963
 Ni^{58} , 12-8 MeV 3=6282
 $Ni^{58}(d,\alpha n)$, 0 to 24 MeV, statistical model analysis 3=19876
 $Ni^{58}(d,\alpha)$, 0 to 24 MeV, statistical model analysis 3=19876
 $Ni^{58}(d,\alpha p)$, 0 to 24 MeV, statistical model analysis 3=19876
 $Ni^{58,60}(d,p)Ni^{59,61}$, 13.8 MeV 3=15222
 $Ni^{58}(d,2np)$, 0 to 24 MeV, statistical model analysis 3=19876
 $Ni^{58,60,62,64}(d,p)$ stripping at 13.6 MeV 3=2489
 Ni^{60} , 12-8 MeV 3=6282
 $Ni^{60}(d,2\alpha)$, 0 to 24 MeV, statistical model analysis 3=19876
 $Ni^{62,63,65}$, study of levels 3=24833
 $O^{16}(d,\alpha)N^{14}$, ang. distrib. 3=8124
 $O^{16}(d,\alpha)N^{14}$, 15-20 MeV 3=22418
 $O^{16}(d,n)F^{17}$, by time-of-flight 3=17494
 $O^{16}(d,p)$ and $O^{16}(d,\alpha)$, 0.8-2.0 MeV, diff. cross-sections 3=2485
 $O^{16}(d,p)O^{17*}$ (0.87 MeV), proton polariz. 3=22421
 $O^{16-18}(d,p)$, 15 MeV 3=12583
 O^{17} , stripping, ang. distrib. 3=22420
 $O^{18}(d,n)F^{19}$, 3-9 MeV differential cross-sections 3=6289
 $O^{18}(d,p)O^{19}$, distorted-wave analysis 3=10381
 $O^{18}(d,t)O^{17}$, distorted-wave analysis 3=10381
 $Pr^{141}(d,p)Pr^{142}$ 3=2360
 $S^{33}(d,p)S^{34}$, 6-0 MeV, proton groups 3=6291
 $Se^{76}(d,p)Se^{77}$, 7.8 MeV 3=17495
 $Si^{28}(d,\alpha)$, analysis 3=2473
 Si^{29} , stripping, ang. distrib. 3=22420
 $Si^{28}(d,p)Si^{29}$, 13.8 MeV 3=15222
 $Si^{28}(d,p)Si^{29}$, Ericson effect 3=8127
 $Si^{28}(d,p)Si^{29}$, 15 MeV, partial wave contribution 3=17492
 $Si^{28}(d,p)Si^{29}$, at 15 MeV, proton polarization 3=682
 $Si^{28}(d,p)Si^{30}$ 3=4667
 $Si^{29}(d,p)Si^{30}$, 4-3 MeV, ang. distrib., calc. 3=6286
 $Si^{29}(d,p)Si^{30}$, energy spectra and ang. distrib. 3=24971
 $Si^{30}(d,p)Si^{31}$ 3=4668
 $Sn^{117}(d,p)Sn^{118}$, 13.6 MeV, and Sn^{118} levels, spin and parity 3=12592
 $Sn^{119}(d,p)Sn^{120}$, 13.6 MeV, and Sn^{120} levels, spin and parity 3=12592
 T , continuous neutron spectra meas. 3=6290
 $Te^{125}(d,p)$, 13-6 MeV, ang. distrib. 3=24973
 $Ti^{48,47,46,48,90}(d,p)Ti^{47,46,48,49,50,51}$ 3=19877
 $V^{51}(d,p)V^{52}$, at 15 MeV, proton polarization 3=683

Nuclear reactions due to — contd

deuterons — contd

- $W + d \rightarrow Re^{184}$, 13.6 MeV, Re^{184} decay, e^+e^- conversion spectra 3=24910
 $W(d,p)$ for various isotopes 3=10270
 $Y^{89}(d,p)Y^{90}$, 15 MeV, ang. distrib., and Y^{90} energy splitting 3=15109
 $Zn^{64}(d,\alpha n)Cu^{61}$, excitation functions and thick-target yields 3=10385
 $Zn^{64}(d,p)Zn^{65} + Zn^{64}(d,n)Ga^{65}(\beta^+)Zn^{65}$ 3=10385
 $Zn^{64}(d,2p)Cu^{64}$, excitation functions and thick-target yields 3=10385
 $Zn^{66}(d,\alpha)Cu^{64}$, excitation functions and thick-target yields 3=10385
 $Zn^{66}(d,n)Ga^{67}$, excitation functions and thick-target yields 3=10385
 $Zn^{68}(d,p)$ and $(d,2n)$, 3-11.6 MeV 3=22423
 $Zn^{68}(d,2n)Ga^{69}$, excitation functions and thick-target yields 3=10385
 $Zn^{67}(d,\alpha n)Cu^{64}$, excitation functions and thick-target yields 3=10385
 $Zn^{67}(d,2p)Cu^{67}$, excitation functions and thick-target yields 3=10385
 $Zn^{68}(d,He^3)Cu^{67}$, excitation function 3=10384
 $Zn^{68}(d,p)$ and $(d,2n)$, 3-11.6 MeV 3=22423
 $Zr(d,p)$ and (d,t) , nuclear structure studies 3=24866

electrons

- electron accelerator shielding, rel. to 3=455
 nuclear recoil in equivalent photon method 3=666
 scattering, non-coherent, on nuclei 3=2438
 Be^9 , disintegration, 17-49 MeV 3=4628
 Cu , cascades, up to 400 MeV 3=22369
 H^3 , disintegration, 400 MeV calc. 3=15048
 He^3 , disintegration, 400 MeV calc. 3=15048
 Li^6 , disintegration, and nucleus model as $\alpha + d$ 3=17455
 Pb , cascades, up to 400 MeV 3=22369

gamma-rays

See Nuclear reactions, photons.

helium-3

- Al^{27} , at 6-24 MeV, excitation functions 3=2497
 Al^{27} , elastic scattering, 26-33 MeV 3=24974
 $B^{11}(He^3,p)C^{13}$, rel. to C^{13} levels 3=8132
 $B^{11}(He^3,p)C^{13}$, 3.1-4.2 MeV meas. 3=15227
 $Be^9(He^3,\alpha)Be^8$, heavy particle stripping 3=19882
 $Be^9 + He^3$ at $E(He^3) \leq 2.0$ MeV 3=22269
 $Be^9(He^3,n)C^{11}$, energy spectra, ang. distrib. 3=19881
 $C(He^3,He^4)$ and $C(He^3,d)$ on plane wave direct interact. theory 3=2493
 C^{12} , at 6-24 MeV, excitation functions 3=2497
 C^{12} , elastic scattering, 26-33 MeV 3=24974
 C^{12} , scatt., 28.5 MeV, ang. distrib. 3=12699
 $C^{12}(He^3,n)O^{14}$, 19, 22 and 25 MeV meas. 3=12701
 $C^{13}(He^3,\alpha\gamma)C^{12}$, ang. correl., reaction mechanism 3=2496
 Cu^{63} , 7-24 MeV, eight reactions meas. 3=12702
 Cu^{65} , 7-24 MeV, five reactions meas. 3=12702
 $F^{18}(He^3,d)Ne^{20}$, 13.0 MeV meas. 3=4670
 $Fe^{56}(He^3,T)$, at 25 MeV 3=2455
 (He^3,d) , with (d,p) , rel. to isobaric spin of target 3=677
 Mg , elastic scattering, 26-33 MeV 3=24974
 Na^{23} , elastic scattering, 26-33 MeV 3=24974
 $N^{14}(He^3,\alpha)N^{13}$, rel. to N^{14} levels 3=8132
 $N^{14}(He^3,p)O^{16}$, 2.5-5.5 MeV 3=15231
 $N^{15}(He^3,\alpha)N^{14*}$, α -particle spectrum 3=6162
 Ne^{20} , scatt., 28.5 MeV, ang. distrib. 3=12699

mesons

- See also Cosmic rays, effects and interactions.
 diffraction processes, rel. to $N-N$ production 3=15169
 K^- , 1.5 GeV/c, in emulsion, hypernuclei 3=10226
 K^- absorption, nuclear emulsion study 3=4660
 K^- capture, in complex nuclei, mechanism 3=15217
 K^- capture in deuterium, non-mesic processes 3=6068
 K^- capture, hyperon resonance states 3=19871
 K^- in emulsion nuclei, hyperon, hyperfragment prodn. 3=8121
 K^- meson capture by complex nuclei 3=12697
 K^- , with emulsions, 50-300 MeV/c, hypernuclei prod. 3=17489
 μ -mesons, relativistic, energy loss rate 3=7882
 $\mu + A \rightarrow \pi + \nu + A$ 3=24768
 μ , in Ca^{40} , capture 3=10371
 μ capture by complex nuclei, hyperfine effects 3=10373
 μ , capture by complex nuclei, theories 3=10371

Nuclear reactions due to —contd mesons —contd

- μ , capture, rel. to universal Fermi interact. 3=4656
- μ -meson capture, radiative, theory 3=17487
- μ , in O^{16} , capture 3=10371
- μ , prodn. of knock-on electrons 3=17300
- μ^- , radiative capture 3=17488
- pion capture, π -nucleon resonances 3=15218
- pion high energy reactions, photon spectra 3=8102
- π^\pm , cascade calc., intranuclear, low-energy 3=22384
- π^- , above 10^8 eV, heavy particle emission 3=4658
- π^- absorpt., ratio neutrons/protons emitted 3=10372
- π^- capture by light nuclei, mechanism 3=22411
- π^- in emulsions, 16.2 GeV/c 3=8120
- π^- in emulsion, Ag, Br, 17 GeV/c, hyperfragments, ang. distrib. anisotropy 3=19872
- π^- , in emulsions, 4.5 and 17 GeV 3=19733
- π^- , 7 GeV, mechanism of primary collision 3=24938
- $\pi^- + He^3$, Panofsky ratio 3=24770
- $\pi^- - N$ collisions, relativistic secondary products 3=2482
- $\pi^- - Xe$ collisions at 8.4 GeV/c, π^0 production 3=2483
- $\Sigma^- + C_{12} \rightarrow \Lambda B^{12} + n$ 3=7975
- Ag, by 4.5 GeV pions, Li^8 , Be and B emission 3=12380
- Br, by 4.5 GeV pions, Li^8 , Be and B emission 3=12380
- on C, $\Lambda^0 K^0$ - pair prodn. 3=6075
- C^{12} , μ^- capture probability, calc. 3=6278
- $C^{12}(\mu, \nu)B^{12}$, capture rate 3=8122
- $C^{12} + \mu^- \rightarrow B^{12} + \nu + \gamma$ 3=17488
- $C^{12}(\pi^-, n)B^{11}$ 3=6277
- $Ca^{40}(\mu, \gamma)$ 3=24961
- Ca^{40} , μ capture, correction from a nuclear surface effect 3=10370
- on Cl, $\Lambda^0 K^0$ - pair prodn. 3=6075
- $Cl^{35,37}$, μ -absorption, shell model calc. 3=10368
- D, K^- capture, Y^* production 3=10170
- on F, $\Lambda^0 K^0$ - pair prodn. 3=6075
- F^{19} , μ capture, hyperfine effects 3=10373
- H, π -meson absorption, in liquid, lifetime 3=10162
- He, K^- capture, Y^* production 3=10170
- $He^3(\mu^-, \nu)H^3$, calc. 3=10181
- $He^4 + \pi^- \rightarrow t + n$ or $d + 2n$ or $p + 3n$ 3=4476
- $He^4(\pi^-, N)$, max. excitation cross-section 3=4474
- $O^{16}(\mu, \gamma)$ 3=24961
- $O^{16}(\pi^-, n)[Li^6 + Be^7]$ 3=6279
- Pb- K^0 , $\Lambda^0(\Sigma^0)$ production 3=6280

neutrons

- See also Neutrons and antineutrons, absorption; Nuclear fission.
- absorption, resonance, calc., lack of temp. effect 3=22147
- capture cross-sections at 30 and 65 keV, survey 3=10364
- capture, by lightest nuclei 3=14987
- capture, as possible γ -ray source of variable energy and high resolution 3=17232
- capture, γ -ray prod. and resonant scatt. 3=6218
- capture reactions in stars 3=1532
- cascade calc., intranuclear, low-energy 3=22384
- cosmic rays in nuclear emulsions 3=24817
- cross-section detm., pile oscillator method, theory 3=25007
- cross-section energy spread due to compound-nucleus level-density fluctuations 3=24855
- data for reactor studies 3=17510
- excited nucleus absorption coeff., optical potential calc. 3=2480
- ferromagnetic and antiferromag. subs., scattering 3=3121
- formation of nuclei heavier than Ca 3=15185
- heavy nuclei—nucleon colls; hydrodynamic theory 3=2439
- inelastic scattering, on nonspherical nuclei 3=22397
- isomeric yield ratio, rel. to cpd. nuc. spin 3=6271
- isomer prod., thermal neutron activation cross-sections 3=10361
- light, medium nuclei, 14 MeV, α -ray spectra 3=6265
- medium-weight nuclei, at 12-18 MeV 3=2476
- (n, α) on heavy nuclei, 14.7 MeV 3=19864
- (n, α) on light nuclei, 14 MeV 3=10362
- (n, α), 14 MeV, statistical model calculations 3=10365
- (n, α) and (n, α) in $Kl(Tl)$ and $C_6(Tl)$, 12.1 to 21.5 MeV 3=2479
- (n, d) in $t_{1/2}$ proton shell nuclei 3=19865
- (n, γ) conversion electrons meas. 3=2245

Nuclear reactions due to —contd neutrons —contd

- (n, γ) for odd Z nuclei, shell effect 3=6273
- (n, γ), 14.7 MeV, for 3 nuclei 3=24952
- (n, γ), internal conversion electrons, spectrometer 3=7831
- (n, γ) reactions, isomeric cross-section ratios 3=675
- (n, He^3), 14.7 MeV, for 4 nuclei 3=24952
- (n, α) + (n, α), 14.7 MeV, for 13 nuclei 3=24952
- (n, 3n), 14.7 MeV, for 3 nuclei 3=24952
- (n, 2n) at 14 MeV, mechanism 3=24950
- (n, np) + (n, pn), 14.7, for 2 nuclei 3=24952
- (n, 2p), 14.7 MeV, for 13 nuclei 3=24952
- (n, n' γ), coincidence, n' γ , meas., circuit 3=19870
- (n, 2n) cross-sections, 14.1 MeV, nuclei with β^+ residual activity 3=6260
- (n, p) reactions, energy spectra, statistical model 3=2426
- (n, t) on medium-wt. nuclei 3=22403
- neutron transfer in nuclear collisions 3=4654
- neutron widths, strength functions 3=19760
- optical-model fringe absorption and neutron strength function, erratum 3=8113
- optical model, radiative capture and inelastic scatt. 3=19869
- resonance absorpt., materials with grain structure 3=6263
- resonance integrals, effective, equivalence relations 3=6262
- resonance theory for neutrons below 5 MeV 3=6274
- slow-neutron resonances, statistical model 3=2426
- spherical nuclei, low energy, optical model 3=24947
- spherical nuclei surface, collective interaction 3=24943
- spinless, with rectangular complex cavity 3=10352
- statistical model, comp. with expt. 3=2476
- stripping, radioactive heavy-ions detector 3=12609
- temperatures, kinetic and activation, calc. 3=22390
- 20 elements, inelastic scatt., rel. to nuclear level densities 3=8107
- various elements, absorption cross-sect. meas. 3=24946
- Ag, capture, averaged cross-sections, 1-50 keV 3=17479
- Ag, capture, γ -ray spectra 3=6267
- Ag, radiative capture cross-sections, 18-300 keV 3=4648
- $Ag^{107}(n, \gamma)Ag^{108}$, γ - γ coincidences 3=15215
- $Ag^{107}(n, 2n)Ag^{108}$, 12-19.6 MeV 3=12690
- $Ag^{107}(n, \alpha)Rh^{104}$ 3=12693
- $Ag^{107}(n, 2n)$, by 2511 keV annihilation γ coincidences 3=24951
- Ag^{110m} , reactor neutron capture cross-section 3=22401
- Al (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
- Al^{27} , 14 MeV, activation cross-sections 3=22407
- Al^{27} , (n, α) Na^{24} , absolute cross-sections 3=24949
- $Al^{27}(n, p)$, (n, γ), cross-sections, 2.5-5 MeV 3=6269
- $Al^{27}(n, \alpha)$, at 15 MeV 3=12692
- $Al^{27}(n, \gamma)Al^{28}$, 14 MeV 3=10366
- $Al^{27}(n, \alpha)Na^{24}$, recoil nuclei, forward-backward asymmetry 3=19868
- $Al^{27}(n, \alpha)$, at 12-18 MeV, cross-section 3=2476
- $Al^{27}(n, \alpha)Na^{24}$, 14 MeV, Na^{24} forward-backward asymmetry 3=10367
- $Al^{27}(n, \alpha)Na^{24}$, ang. distrib. 3=6264
- $Al^{27}(n, \alpha)Na^{24}$, excit. curves up to 20 MeV 3=8109
- $Al^{27}(n, \alpha)Na^{24}$, using fission neutrons 3=8116
- $Al^{27}(n, \alpha)Na^{24}$, 14 MeV 3=19863
- $Al^{27}(n, np)$, 14.8 MeV, by cpd. nucleus theory 3=17481
- $Al^{27}(n, p)$, at 12-18 MeV, cross-section 3=2476
- $Al^{27}(n, p)Mg^{27}$, 14.8 MeV 3=19861
- $Al^{27}(n, p)Mg^{27}$, range, recoil, in Al 3=6270
- $Al^{27}(n, p)Mg^{27}$, 14.8 MeV 3=19861
- As, 14 MeV, total cross-section 3=22402
- $As^{75}(n, \alpha)$, 14 MeV, level densities of residual nucleus 3=6265
- Au, capture, γ -ray spectra 3=6266
- Au, radiative capture cross-sections, 18-300 keV 3=4648
- Au, radiative capture cross-sections, 30 keV 3=17478
- $Au^{197}(n, \alpha)$, 14.7 MeV 3=19864
- Au^{197} , neutron-activated cross-sections 3=4651
- Au^{198} , resonance integrals 3=17485
- B, thermal absorpt., precise meas. 3=12694
- $B^{10}(n, \alpha)Li^7$, used in nuclear spot-welding 3=13977
- $B^{10}(n, \alpha)$, cross-section dependence on neutron energy 3=4653
- $B^{10}(n, \alpha)Li^7$, rel. to $B^{10}(n, \alpha)Li^7$ 3=674

Nuclear reactions due to — contd

neutrons — contd

Be^{10} , thermal absorpt., precise meas. 3=12694
 $\text{Be}(n, \gamma)$, 50 keV-10 MeV, γ -ray cascades 3=24948
 $\text{Be}^7(n, \alpha)\text{He}^4$ 3=17480
 $\text{Be}^7(n, \gamma)\text{He}^4$ 3=17480
 $\text{Be}^9(n, 2n)$ at 14 MeV, mechanism 3=24950
 Bi^{209} , γ -ray spectra, on scatt. inelastic, 2.95 MeV 3=8106
 $\text{Bi}^{209}(n, \beta^-)\text{Po}^{210}$, cross-section 3=10356
 $\text{Bi}^{209}(n, 2n)$ at 14 MeV, mechanism 3=24950
 Br , capture, averaged cross-sections, 1-50 keV 3=17479
 $\text{Br}(n, \gamma)$, recoil products separation, by elec. field 3=8110
 $\text{Br}^{78}(n, \alpha)\text{As}^{76}$, 12-19 MeV 3=15210
 C^{12} , 3-660 keV, total cross-section 3=24954
 $\text{C}^{12}(n, \alpha)\text{Be}^9$, 14 MeV 3=12691
 $\text{C}^{13}(n, \alpha)\text{Be}^9$, in stilbene, scintillation study 3=14489
 $\text{Ca}^{40}(n, \alpha)$, α spectrum, ang. distrib. 3=22408
 Cd , radiative capture cross-sections, 30 keV 3=17478
 $\text{Cd}^{113}(n, \gamma)\text{Cd}^{114}$, levels, from capture γ , internal conversion β spectra 3=24959
 $\text{Ce}^{138}(n, \gamma)\text{Ce}^{139}$, isomeric cross-section ratios 3=675
 Cl , cross-sections 3-5 MeV 3=19860
 $\text{Cl}(n, \gamma)$, 50 keV-10 MeV, γ -ray cascades 3=24948
 $\text{Cl}^{35}(n, \gamma)\text{Cl}^{36}$, γ - γ ang. correls. 3=6268
 Cl^{35} , resonance parameters 3=4655
 $\text{Cl}^{35}(n, p)$, cross-sections, 0.2-20 keV 3=4655
 $\text{Co}(n, \gamma)$, neutron capture, γ -ray spectra 3=22409
 Co^{59} , absolute cross-sections 3=24949
 $\text{Co}^{59}(n, \alpha)\text{Mn}^{56}$ 3=6264
 $\text{Co}^{59}(n, \alpha)$, at 12-18 MeV, cross-section 3=2476
 $\text{Co}^{59}(n, p)\text{Mg}^{57}$, 14.8 MeV 3=19861
 Co^{59} , thermal capture, spin depend. 3=15213
 Co^{60} , resonance capture integral 3=22400
 $\text{Cr}^{53}(n, \gamma)\text{Cr}^{54}$ 3=19866
 Cs , capture, averaged cross-sections, 1-50 keV 3=17479
 Cs , capture, γ -ray spectra 3=6267
 CsI:Tl crystals, (n,p), (n,d), (n, α) reactions 14.6 MeV 3=12689
 Cu , γ spectra from capture 3=4649
 $\text{Cu}(n, \gamma)$, neutron capture, γ -ray spectra 3=22409
 Cu , U, Th, at 0.8 and 2.8 MeV, small angle scattering 3=4646
 $\text{Cu}^{65}(n, 2n)\text{Cu}^{64}$, 12-19 MeV 3=15210
 $\text{Cu}^{65}(n, 2n)\text{Cu}^{64}$, 12-19.6 MeV 3=12690
 $\text{Cu}^{65}(n, p)\text{Ni}^{65}$, 12-19 MeV 3=15210
 $\text{D}(n, p)2n$, 14.4 MeV 3=17350
 $\text{Er}(n, \gamma)$ 3=15209
 $\text{Er}^{164}(n, \gamma)\text{Er}^{165}$ 3=22344
 F , radiative capture cross-sections, 30 keV 3=17478
 $\text{F}^{19}(n, 2n)\text{F}^{18}$, in fluoro-organic cpds. 3=5171
 $\text{F}^{19}(n, \gamma)\text{F}^{20}$, thermal cross-section 3=8030
 $\text{Fe}(n, n'\gamma)$, test of neutron source 3=24742
 $\text{Fe}(n, \gamma)$, neutron capture, γ -ray spectra 3=22409
 $\text{Fe}^{54}(n, \alpha)\text{Cr}^{51}$, at 15 MeV 3=12693
 $\text{Fe}^{54}(n, 2n)$, by 2511 keV annihilation γ coincidences 3=24951
 $\text{Fe}^{56}(n, d)\text{Mn}^{55}$ 3=19865
 $\text{H}^2(n, 2n)$ at 14 MeV, mechanism 3=24950
 $\text{He}^3(n, p)$, cross-section dependence on neutron energy 3=4653
 $\text{Hf}^{177}(n, \gamma)\text{Hf}^{178}$, thermal capture 3=8011
 Hf^{180} , neutron-activated cross-sections 3=4651
 Hg , capture, γ -ray spectra 3=6266
 Hg , radiative capture cross-sections, 18-300 keV 3=4648
 $\text{Hg}^{196}(n, \gamma)\text{Hg}^{197}$, isomeric cross-section ratios 3=675
 Hg^{201} , total radiation widths 3=15211
 $\text{Ho}(n, \gamma)$, capture, 60-500 keV γ 's 3=10355
 $\text{Ho}^{166}(n, \alpha)$, 14.7 MeV 3=19864
 I , capture, averaged cross-sections, 1-50 keV 3=17479
 I , capture, γ -ray spectra 3=6267
 $\text{I}(n, \gamma)$, recoil products separation, by elec. field 3=8110
 I^{127} , capture cross-section, 0.02 to 2.5 MeV 3=2478
 I^{127} , γ -ray spectra, on scatt. inelastic, 2.95 MeV 3=8106
 In , capture, averaged cross-sections, 1-50 keV 3=17479
 $\text{In}(n, \alpha)\text{Ag}$, α -particles ang. distrib. 3=2475
 In^{115} , resonance integrals 3=17485
 In^{116} isomers formation, by thermal n capture, cross-section ratios 3=8114
 In^{116} , 2.16 sec. isomer, thermal neutron activation 3=15112
 Ir , capture, averaged cross-sections, 1-50 keV 3=17479
 $\text{Ir}^{181, 193}$, total radiation widths 3=15211

Nuclear reactions due to — contd

neutrons — contd

$\text{K}^{39}(n, \alpha\gamma)\text{Cl}^{36}$, coincidence study, 5.4 MeV 3=8115
 $\text{K}^{39}(n, \gamma)\text{Ar}^{39}$, coincidence study, 5.4 MeV 3=8115
 La^{139} , γ -ray spectra, on scatt. inelastic, 2.95 MeV 3=8106
 $\text{Li}^6(n, \alpha)$, cross-section dependence on neutron energy 3=4653
 $\text{Li}^6(n, \alpha)\text{H}^3$, det. of Li impurities in target materials 3=22403
 $\text{Li}^6(n, \alpha)\text{H}^3$, 2-15 MeV, cross-section, for D-D neutrons 3=8119
 $\text{Li}^6(n, \alpha)\text{H}^3$, used in nuclear spot-welding 3=13977
 $\text{Li}^6(n, p)\text{He}^6$, 3.5-14.8 MeV 3=24953
 $\text{Li}^6(n, t)\text{He}^4$, 150-250 keV, differential cross-section 3=12695
 $\text{Li}^6(n, 2n)$, 10-2 and 14-1 MeV meas. 3=8112
 $\text{Li}^6(n, t)\text{He}^4$, use in neutron spectrometry 3=19656
 $\text{Li}^7(n, n')\text{Li}^{7*}$, cross-section at 14 MeV 3=2474
 $\text{Li}^7(n, 2n)$, 10-2 and 14-1 MeV meas. 3=8112
 $\text{Li}^7(n, t)$, 3.5-15 MeV meas. 3=19858
 $\text{Lu}(n, \gamma)$, capture, 60-500 keV γ 's 3=10355
 $\text{Lu}^{175}(n, \alpha)$, 14.7 MeV 3=19864
 $\text{Mg}^{24}(n, p)\text{Na}^{24}$, excit. curves up to 20 MeV 3=8109
 $\text{Mg}^{24}(n, p)$, at 12-18 MeV, cross-section 3=2476
 $\text{Mg}^{24}(n, p)\text{Na}^{24}$, absolute cross-sections 3=24949
 $\text{Mn}(n, \gamma)$, neutron capture, γ -ray spectra 3=22409
 $\text{Mn}^{55}(n, \alpha)$, at 12-18 MeV, cross-section 3=2476
 $\text{Mn}^{55}(n, \alpha)$, 14 MeV, level densities of residual nucleus 3=6265
 Mo , radiative capture cross-sections, 30 keV 3=17478
 $\text{Mo}^{92, 94-96}(n, p)\text{Nb}^{92, 94-96}$, by fission neutrons, cross-sections 3=2477
 $\text{Mo}^{92, 94-96, 100}$, total and radiative capture cross-sections, 7-15000 eV 3=24956
 Mo^{95} , capture γ -ray spectra, s and p-wave resonances 3=24958
 $\text{Mo}^{95}(n, \gamma)\text{Mo}^{96}$, γ - γ ang. correls. 3=6268
 Mo^{96} , capture, averaged cross-sections, 1-50 keV 3=17479
 Mo^{100} , capture, averaged cross-sections, 1-50 keV 3=17479
 $\text{N}^{14}(n, d)$ at 14 MeV, ang. distrib. 3=8111
 Na^{23} , 14 MeV, activation cross-sections 3=22407
 $\text{Na}^{23}(n, \alpha)$, 14 MeV, level densities of residual nucleus 3=6265
 Nb , capture, averaged cross-sections, 1-50 keV 3=17479
 Nb^{93} , capture γ -ray spectra, s and p-wave resonances 3=24958
 Nb^{93} radiative capture cross-sections 3=8118
 Ni , γ spectra from capture 3=4649
 $\text{Ni}(n, \gamma)$, neutron capture, γ -ray spectra 3=22409
 Ni^{58} , absolute cross-sections 3=24949
 $\text{Ni}^{58}(n, \alpha)\text{Fe}^{56}$, 14 MeV, ground state transition 3=12686
 $\text{Ni}^{58}(n, p)\text{Co}^{58}$, 1.6-14.7 MeV meas. 3=8117
 $\text{Ni}^{58}(n, p)\text{Co}^{58m, 5}$, 1.04-2.67 MeV 3=15214
 $\text{O}^{16}(n, \alpha)\text{C}^{13}$, 12-19 MeV 3=15210
 $\text{O}^{16}(n, p)\text{N}^{16}$ 3=22405
 P , cross-sections 3-5 MeV 3=19860
 $\text{P}^{31}(n, d)$, at 14 MeV, ang. distrib. 3=8111
 $\text{P}^{31}(n, \alpha)\text{Al}^{28}$, 12-19 MeV 3=15210
 $\text{P}^{31}(n, \alpha)$, at 12-18 MeV, cross-section 3=2476
 $\text{P}^{31}(n, 2n)$ by 2511 keV annihilation γ coincidences 3=24951
 $\text{P}^{31}(n, 2n)\text{P}^{32}$, 12-19 MeV 3=15210
 Pb , capture, γ -ray spectra 3=6266
 $\text{Po}^{210}(n, \alpha)$, capture cross-section, upper limit 3=22404
 Pt , radiative capture cross-sections, 30 keV 3=17478
 $\text{Pt}^{192, 194}(n, \gamma)\text{Pt}^{193m, 195m}$, cross-sections 3=675
 $\text{Pt}^{196}(n, \gamma)\text{Pt}^{197}$, isomeric cross-section ratios 3=675
 Rb^{85} , capture, averaged cross-sections, 1-50 keV 3=17479
 $\text{Re}^{186, 188}$, capture, low-energy γ -ray spectra 3=12696
 Rh , capture, averaged cross-sections, 1-50 keV 3=17479
 $\text{Rh}^{103}(n, \gamma)\text{Rh}^{104}$ 3=6272
 Rh^{103} , 0.032 eV-14.87 MeV, cross-sections 3=10360
 $\text{Rh}^{103}(n, \alpha)\text{Tc}^{100}$ 3=10360
 $\text{Ru}^{99, 104}$, total radiation widths 3=15211
 S , cross-sections 3-5 MeV 3=19860
 S , radiative capture cross-sections, 30 keV 3=17478
 $\text{S}^{32}(n, d)$, at 14 MeV, ang. distrib. 3=8111
 $\text{S}^{32}(n, p)\text{P}^{32}$, E_D and ang. distrib., cross-sections 3=19862
 $\text{S}^{32}(n, p)\text{P}^{32}$, as fast-neutron monitor, 2-20 MeV 3=12687
 $\text{S}^{32}(n, p)\text{P}^{32}$, using fission neutrons 3=8116
 Sb , capture, averaged cross-sections, 1-50 keV 3=17479
 Sb^{121} , total radiation widths 3=15211

Nuclear reactions due to —contd

neutrons —contd

- Sb¹²¹(n,2n), by 2511 keV annihilation γ coincidences 3=24951
 Sb¹²¹(n,2n)Sb¹²⁰, 12-19.6 MeV 3=12690
 Sc (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
 Si, cross-sections 3-5 MeV 3=19860
 Si(n, α)Mg, 6-9 MeV, excitation fluctuations 3=19867
 Si(n, p)Al, 6-9 MeV, excitation fluctuations 3=19867
 Si²⁸(n,p)Al²⁸, 14 MeV, p ang. distrib., calc., correction 3=17482
 Si²⁸(n, p) Al²⁸, absolute cross-sections 3=24949
 Si²⁸,²⁹(n, α)Mg²⁵,²⁶, Mg²⁵,²⁶ energy levels 3=8108
 Si²⁹(n, α)Mg²⁸, compound nucleus formation 3=15212
 Si²⁹(n, α)Mg²⁵, 12.5-18.5 MeV 3=2473
 Si²⁸(n, α), up to 5.5 MeV 3=10359
 Si²⁸(n,p), up to 5.5 MeV 3=10359
 Sm nuclides, capture, 30 keV, and synthesis of elements 3=10354
 Sm¹⁴⁴(n,2n)Sm¹⁴³ 3=6174
 Sm¹⁴⁹(n, γ), γ and conversion electrons 3=10353
 Sn, capture, γ -ray spectra 3=6267
 Sn(n,p), giving isomeric and ground states of In and Sb isotopes 3=22406
 Sn, radiative capture cross-sections, 30 keV 3=17478
 Sn¹¹²,¹¹⁶,¹¹⁸,¹¹⁹,¹²⁰(n,p), 14.5 MeV 3=22410
 Sn¹¹⁶⁻¹²⁰,¹²²,¹²⁴, total cross-sections, 14.2 MeV 3=17483
 Ta, capture, γ -ray spectra 3=6266
 Ta, radiative capture cross-sections, 18-300 keV 3=4648
 Ta, radiative capture cross-sections, 30 keV 3=17478
 Ta(n, γ) 3=15209
 Ta¹⁸¹(n, α), 14.7 MeV 3=19864
 Ta¹⁸¹(n, γ) at 2.95 MeV 3=6256
 Ta¹⁸¹, neutron-activated cross-sections 3=4651
 Tb(n, γ) 3=15209
 Te isotopes, (n, α) cross-sections at 14.8 MeV 3=10358
 Te(n,p) giving isomeric and ground states of In and Sb isotopes 3=22406
 Te¹²⁰,¹³⁰(n, γ)Te¹²¹,¹³¹, isomeric cross-section ratios 3=675
 Te¹²⁷,¹²⁹,¹³⁰*(n,2n), 14.8 MeV, activation cross-sections 3=10358
 ThO₂ grains in graphite matrix, resonance absorpt. 3=6263
 Ti (n, γ), 50 keV-10 MeV, γ -ray cascades 3=24948
 Ti⁴⁷(n, p)Sc⁴⁷, cross-section, var. with n energy 3=24957
 Ti⁴⁸(n,p), at 12-18 MeV, cross-section 3=2476
 Ti⁵⁰, 14 MeV, activity 3=10287
 Ti²⁰⁵ radiative capture cross-sections 3=8118
 Tm(n, γ), capture, 60-500 keV γ 's 3=10355
 U metal and oxide, resonance integral temp. coeff. 3=4687
 U, radiative capture cross-sections, 18-300 keV 3=4648
 U²³³, capture to fission ratio, epithermal n 3=22434
 U²³⁵, capture cross-section, 0.02-2 eV 3=6258
 U²³⁵, effective resonance integral, temp. coeff. 3=12688
 U²³⁵ resonance capture in U metal, UO₂ rods 3=6261
 U²³⁵, resonance escape probab., resonance integrals 3=6262
 U²³⁸, in uranium oxide, resonance, 4.77°K, 6.7eV 3=6259
 U²³⁸, resonance parameters 3=10357
 U²³⁸, γ from capture 3=4647
 U²³⁸, 40 keV-16 MeV, optical model calc. 3=4650
 V⁵¹(n, d)Ti⁵⁰, 14.4 MeV, meas. 3=4652
 V⁵¹(n,p)Ti⁵¹, 12-19 MeV 3=15210
 V⁵¹, below 25 keV, s-wave neutron strength function 3=24955
 V⁵¹ radiative capture cross-sections 3=8118
 W, capture, γ -ray spectra 3=6266
 W, radiative capture cross-sections, 18-300 keV 3=4648
 W, radiative capture cross-sections, 30 keV 3=17478
 W¹⁸⁶, neutron-activated cross-sections 3=4651
 W¹⁸⁶ radiative capture cross-sections 3=8118
 Y, radiative capture cross-sections, 30 keV 3=17478
 Y⁸⁸(n,n' γ), level excitation 3=10363
 Yb(n, γ) 3=15209
 Zn⁶⁴(n, α)Ni⁶¹, at 15 MeV 3=12693
 Zn⁶⁴(n,2n)Zn⁶³, 12-19 MeV 3=15210
 Zn⁶⁴(n,p), at 12-18 MeV, cross-section 3=2476
 Zn⁶⁴(n,p)Cu⁶⁴, 12-19 MeV 3=15210
 Zn⁶⁴(n,2n)Zn⁶³, 12-19.6 MeV 3=12690
 Zr⁹¹, capture γ -ray spectra, s and p-wave resonances 3=24958

Nuclear reactions due to —contd

nuclei of Z>2

- complex nuclei, complex nucleus mechanism, recoil range evidence 3=6303
 Coulomb excitation by N¹⁴ and Ne²⁰ ions 3=10237
 heavy-ion reactions, compound-nuc. formation 3=24979
 heavy ions, scattered on medium and heavy nuclei 3=15232
 in photographic emulsion, multicharged-particle interaction 3=24985
 neutron evaporation, ang. momentum effect 3=17499
 neutron transfer, cross-sect. rel. to energy 3=8139
 p, α transfer, in collisions 3=6296
 Ag + Be⁹ → Be⁸ 3=24981
 Al—N¹⁵ react., N¹⁷ production 3=2501
 Al—Ne²², N¹⁷ production 3=2501
 Al—O¹⁶ react., N¹⁷ production 3=2501
 Al + N¹⁴ → N¹⁷, with neutron transfer 3=2502
 Al + N¹⁴ → N¹³, with neutron transfer 3=2502
 Al + N¹⁵ → N¹⁷, with neutron transfer 3=2502
 Al with Ne²⁰, N¹⁴ ions, neutron pick-up and proton stripping 3=6302
 Al²⁷, due to 27.5 MeV N¹⁴ ions 3=6301
 Al²⁷(N¹⁴, O¹⁶)Mg²⁶, 27.5 MeV, near barrier 3=12703
 Au¹⁹⁷(Li⁶, α p)Au¹⁹⁸, excitation functions, 15-40 MeV 3=19888
 Au¹⁹⁷(Li⁶, Li⁷)Au¹⁹⁸, excitation functions, 15-40 MeV 3=19888
 B¹⁰(N¹⁴, C¹³)C¹¹, range and ang. distrib. 3=17501
 B¹⁰(N¹⁴, N¹³)B¹¹, range and ang. distrib. 3=17501
 B¹⁰,¹¹ + Li^{6,7}, gamma-rays 3=15238
 B¹¹, due to 27.5 MeV N¹⁴ ions 3=6301
 Be⁹, by Li⁶, α - γ coincidences 3=19157
 Be⁹ + Li^{6,7}, gamma-rays 3=15238
 Be⁹ disintegration in Coulomb field of heavy nuclei 3=24977
 Be⁹(Li⁷, Li⁸)Be⁸, Coulomb distorted-wave approx. 3=24980
 Br + Be⁹ → Be⁸ 3=24981
 C with Ne²⁰, N¹⁴ ions, neutron pick-up and proton stripping 3=6302
 C—N¹⁵ react., N¹⁷ production 3=2501
 C—Ne²² react., N¹⁷ production 3=2501
 C—O¹⁶ react., N¹⁷ production 3=2501
 C¹²—C¹² inelastic scatt., 126 MeV 3=15101
 C¹²(C¹², α)Ne²⁰, high spin resonances 3=19889
 C¹²(C¹², α)Ne²⁰, quasimolecular states 3=12704
 C¹²—He³ inelastic scatt. at 28.5 MeV 3=8129
 C¹² + Li^{6,7}, gamma-rays 3=15238
 C¹²(Li⁶, d)O¹⁶, 3.4-4.0 MeV, differential cross-section 3=6298
 C¹²(Li⁶, p)O¹⁷, 3.4-4.0 MeV, differential cross-section 3=6298
 C¹² + Li⁶ at 3 MeV, ang. distrib. meas. 3=8136
 C¹² + C¹² → 6 α , at 115 MeV 3=15235
 C¹² + C¹², 123 MeV, α , p ang. distrib. 3=17500
 Cl^{35,37}, due to 27.5 MeV N¹⁴ ions 3=6301
 Cl³⁶(N¹⁴, N¹⁵)Cl^{34m}, 27.5 MeV, near barrier 3=12703
 Cl³⁶(N¹⁴, O¹⁶)S³⁴, 27.5 MeV, near barrier 3=12703
 Cu + N¹⁴ → N¹⁷, with neutron transfer 3=2502
 Cu + N¹⁵ → N¹⁷, with neutron transfer 3=2502
 Cu with Ne²⁰, N¹⁴ ions, neutron pick-up and proton stripping 3=6302
 Cu(Ne²², γ), 74-145 MeV 3=24986
 Cu—Ne²², react., N¹⁷ production 3=2501
 Cu—O¹⁶ react., N¹⁷ production 3=2501
 Cu(O¹⁶, γ), 74-145 MeV 3=24986
 F¹⁹, due to 27.5 MeV N¹⁴ ions 3=6301
 F¹⁹(C¹³, γ)P³⁰, yield 3=19890
 I¹²⁷(Li⁷, 3n)Ba^{131m} 3=8000
 K³⁹(N¹⁴, O¹⁶)Ar³⁸, 27.5 MeV, near barrier 3=12703
 Li—Li, charged particle emission meas. 3=6300
 Li—N¹⁵ react., N¹⁷ production 3=2501
 Li—Ne²² react., N¹⁷ production 3=2501
 Li—O¹⁶ react., N¹⁷ production 3=2501
 Li⁶(Li⁷, t)B¹⁰, 3=15167
 Li⁶,⁷(Li^{6,7}), at 2.6 and 3.6 MeV, γ -rays from residual nuclei 3=685
 Li⁶ + Li⁶ → Be⁸ + α , ang. distrib. 3=6299
 Li⁶(Li⁶, α)Be⁸ → 3 α , 1.9 MeV, mechanism 3=22430

Nuclear-reactions due to — contd

nuclei of $Z > 2$ — contd

- Li⁶ + Li⁶, 2 MeV, product energy and angle distrib., and
 Li⁶ + Li⁶ complex 3=22431
 Li⁶ + Li⁷ → α + Be⁹ 3=8137
 N¹⁴; ⁴⁺ ions, excitation of Cu, Ge, Mo, Pd 3=10260
 Ni + N¹⁴ → N¹³, with neutron transfer 3=2502
 P³¹, due to 27.5 MeV N¹⁴ ions 3=6301
 Pb(C¹²), α-emitting nuclei prod. 3=6193
 S³²—He³ inelastic scatt. at 28.5 MeV 3=8129
 S³²(N¹⁴, O¹⁶)P³¹, 27.5 MeV, near barrier 3=12703
 Si, due to 27.5 MeV N¹⁴ ions 3=6301
 Sn¹²⁴ + O¹⁶ → Ce¹³⁴, ¹³⁵, ^{137m}, excitation functions 3=15233
 Sn¹²⁴ + O¹⁶ → La¹³⁵, Ba^{133m}, ^{135m}, excit. functions 3=15234
 Ta with Ne²⁰, N¹⁴ ions, neutron pick-up and proton stripping 3=6302
 Ta + N¹⁴ → N¹⁷, with neutron transfer 3=2502
 Ta + N¹⁵ → N¹⁷, with neutron transfer 3=2502
 Ta(Ne²², γ), 74-145 MeV 3=24986
 Ta(O¹⁶, γ), 74-145 MeV 3=24986
 Te^{128,130} + C¹² → Ce¹³⁴, ¹³⁵, ^{137m}, excitation functions 3=15233
 Te^{128,130} + C¹² → La¹³⁵, Ba^{135m}, ¹³³ⁿ 3=15234
 Th²³²(Ne²², 4n)Fm²⁵⁰ 3=8138
 Th²³² Ne²² irr., nucleon transfer 3=24983
 U(Ne²², γ), 74-145 MeV 3=24986
 U(O¹⁶, γ), 74-145 MeV 3=24986
 U²³⁸, interactions with B¹¹, O¹⁶, Ne^{20,22}, formation of spontaneously fissioning isotope 3=24984
 U²³⁸—Ne²² bombardment, Md²⁶⁶ prod. 3=8135
 U²³⁸—Ne²² bombardment, Md²⁶⁶ prod. 3=8140
 V⁵¹(C¹², 2n)Cu⁶¹ 3=4674
 W(Ne²², γ), 74-145 MeV 3=24986
 W(O¹⁶, γ), 74-145 MeV 3=24986

photons

- acnodes on unphysical sheets 3=17205
 cross-section fluctuations, using 441 keV reson. γ's from Li⁷ + p 3=8072
 cross-sections, 5-13 MeV, transition strength functions 3=15173
 data for reactor studies 3=17510
 deuteron disintegration, dispersion relns. 3=612
 direct and compound nucleus effects, theory 3=15174
 direct photoeffect rel. to optical model 3=6136
 disintegration of three-particle nuclei, up to 35 MeV 3=22365
 E1 giant resonance, peak splitting calc. 3=6222
 γ-quanta, with oriented nonspherical nuclei 3=4620
 (γ, α) at (0.5-2.0) × 10⁹ °K for A=40-60 3=24941
 (γ, d), theory 3=15177
 (γ, α) reactions on medium wt. nuclei 3=15179
 (γ, n) and (γ, p), effect of spin-orbital bond 3=4613
 (γ, np), light nuclei, rel. to nucleon-nucleon correl. 3=19834
 (γ, p), 22 MeV bremsstrahlung, on 13 ≤ Z ≤ 50, p > 8 MeV, ang. distrib. 3=19830
 (γ, p) at (0.5-2.0) × 10⁹ °K for A=40-60 3=24941
 (γ, pn), rel. to nuclear pair correl. function and momentum distrib. 3=7964
 (γ, Tn) excitation functions up to 80 MeV 3=4623
 giant resonance, configs. with two or more particle-hole pairs 3=8075
 giant resonance photoabsorpt. characteristics 3=7979
 giant resonance rel. to nuclear phonon excitations 3=8078
 high-energy, sum rules 3=24920
 light nuclei, photodisintegration, review 3=19831
 light nuclei, photoprotons, direct interact. model 3=10328
 rel. to nuclear surface shape and optical anisotropy meas. 3=15087
 photoabsorption branches rel. to photoproduct energy spectra 3=6137
 photoneutron multiplicity meas. 3=10330
 photoneutron yield, electron accelerator shielding 3=455
 π photoprod. cross-section 3=12654
 π photoprod., study by N/D method 3=7891
 pion photoprod., nuclei with one nucleon outside closed shell 3=2430
 resonance and direct, projection operator formalism 3=22362
 scattering, on nuclei, dispersion relations 3=8069

Nuclear reactions due to — contd

photons — contd

- Ag¹⁰⁷(γ, n), threshold to 23 MeV, rel. to giant res. splitting 3=6230
 Ag(γ, p), 14.8 and 17.6 MeV, cross-sections 3=10324
 Al²⁷(γ, α), forward-backward asymmetry, rel. to α energy 3=4618
 Al(γ, n), cross-section 3=6223
 Al²⁷(γ, n), resonances, cross-sections 13-24 MeV 3=4615
 Al(γ, p), 14.8 and 17.6 MeV, cross-sections 3=10324
 Al(γ, p), 24 MeV, meas. and theory 3=4614
 Al, 22 MeV, photoprotons 3=10326
 Al(γ, π⁰), 154 MeV 3=24762
 B(γ, p), high-energy, meas. and theory 3=8079
 B(γ, p), proton polarization meas. 3=4624
 B¹⁰(γ, d), excitation functs. 3=6224
 B¹⁰(γ, p), excitation functs. 3=6224
 B¹¹(γ, p), (γ, d), (γ, t) 3=6225
 B¹¹(γ, 2p)Li⁶ → Be⁸ + β⁻, 320 MeV and unknown β activity 3=15136
 Be⁹(γ, d), excitation functs. 3=6224
 Be⁹(γ, n)Be⁸, n polarization, mag. dipole transition effects 3=22364
 Be⁹(γ, p), α-particle model, theory 3=2435
 Be⁹(γ, p), excitation functs. 3=6224
 Be(γ, p), high energy, meas. and theory 3=8079
 Be(γ, p), proton polarization meas. 3=4624
 Be(γ, π⁰), 154 MeV 3=24762
 C¹²(γ, α)Be⁸, and non-existence of 4 MeV Be⁸ level 3=17450
 C¹²(γ, n)C¹¹, neutron spectrum 3=662
 C¹²(γ, n)C¹¹, 30.5 MeV, neutron spectra 3=4621
 C¹²(γ, p), α-particle model, theory 3=2435
 C(γ, p), high-energy, meas. and theory 3=8079
 C(γ, p), proton polarization meas. 3=4624
 C(γ, p), 30.5 MeV 3=17451
 C¹²(γ, p), 31 MeV photons, proton spectrum 3=663
 C¹²(γ, π⁰)C¹², elastic, at 155 MeV 3=6036
 C¹², giant resonance structure 3=8075
 C¹², photodisintegration calc. 3=6137
 C, photoprotons at 60° 3=2434
 Ca⁴⁰(γ, p)K³⁹, up to 22 MeV 3=6226
 Ca⁴⁰, photodisintegration calc. 3=6137
 Cd(γ, α), 21 and 30 MeV 3=15179
 Cd(γ, π⁰), 154 MeV 4=24762
 Cl³⁵(γ, n)Cl³⁴, 30 MeV, cross-sections 3=8071
 Co⁵⁹(γ, n), meas. up to 28 MeV 3=6221
 Co⁵⁸(γ, 2n), meas. up to 28 MeV 3=6221
 Cu(γ, α), 21 and 30 MeV 3=15179
 Cu(γ, p), (γ, d), (γ, t) 3=6225
 Cu(γ, p), 14.8 and 17.6 MeV, cross-sections 3=10324
 Cu(γ, π⁰), 154 MeV 3=24762
 Cu, photodeuteron and photoproton yield 3=19833
 Cu, 22 MeV, photoprotons 3=10326
 Ho¹⁶⁵(γ, n) and (γ, 2n), meas. 3=10329
 In¹¹⁵(γ, n), neutron yield, energy and angular distrib. 3=15175
 In¹¹⁵(γ, n), threshold to 23 MeV, rel. to giant res. splitting 3=6230
 Li(γ, d) 160-260 MeV 3=2436
 Li(γ, p), high-energy, meas. and theory 3=8079
 Li(γ, p), proton polarization meas. 3=4624
 Li⁶, rel. to electrodisintegration, α + d model 3=17455
 Li⁶(γ, p), (γ, d), (γ, t) 3=6225
 Li⁷(γ, α)H³, α spectrum and possible Li⁷, 5.5 MeV, J = 5/2 state 3=17397
 Li⁷(γ, p)He⁴ 3=6229
 Li⁷(γ, 2p)H² 3=12620
 Li⁷(γ, 2p)H², delayed neutron search 3=2330
 Li⁷(γ, t)He⁴ 3=24921
 Li⁷(γ, t)He⁴, ≤ 9.5 MeV, Li⁷ energy levels 3=8070
 Li⁷(γ, t)He⁴, up to 9.5 MeV 3=10249
 Mg²⁴, fission, into 2C¹², 70 MeV bremsstrahlung 3=15247
 Mg, photoprotons 3=10325
 on N, cross-sects. and yields, exptl. and theor. 3=6227
 N¹⁴(γ, n), 30.5 MeV, neutron spectra 3=4622
 N¹⁴(γ, np), energy dependence of cross-sections and distrib. 3=19834
 N(γ, p), 30.5 MeV 3=17451
 N¹⁵, proton prod., 24.5, 31 MeV 3=17452

Nuclear reactions due to —contd**photons —contd**

- Na, photoprotons when irradiated with 18 MeV bremsstrahlung 3=4617
 Nb⁹³(γ , p), 19.5–27.5 MeV, rel. to statist. theory 3=24922
 on Ne, cross-sects. and yields, exptl. and theor. 3=6227
 Ne²⁰(γ , p), 23.5 MeV 3=10327
 Ne(γ , p), 30.5 MeV 3=17451
 Ne²⁰, giant resonance structure 3=8075
 Ni(γ , α), 21 and 30 MeV 3=15179
 Ni(γ , p), 14.8 and 17.6 MeV, cross-sections 3=10324
 Ni, photodeuteron and photoproton yield 3=19833
 O¹⁶ absorption, in giant resonance region 3=8077
 on O, cross-sects. and yields, exptl. and theor. 3=6227
 O(γ , n), cross-sections 3=6223
 O(γ , p), 30.5 MeV 3=17451
 O¹⁶(γ , dn)N¹³ 3=15178
 O¹⁶(γ , dp)C¹³ 3=15178
 O¹⁶(γ , n)O¹⁵, 30.5 MeV, neutron spectra 3=4621
 O¹⁶(γ , n)O¹⁵, 31 MeV, neutron spectrum 3=662
 O¹⁶(γ , n)O¹⁵, 60 MeV, cross-section 3=17453
 O¹⁶(γ , np), energy dependence of cross-sections and distrib. 3=19834
 O¹⁶(γ , π), giant res. up to 170 MeV 3=8076
 O¹⁶, photodisintegration calc. 3=6137
 O¹⁶(γ , n), 30.5 MeV, neutron spectra 3=4622
 P³¹(γ , n), resonances, cross-sections, 13–23 MeV 3=4616
 P³¹(γ , n)P³⁰, 12.45 to 24 MeV 3=10323
 P³¹, photoneutron energy spectrum 3=6220
 Pb²⁰⁸(γ , d) 3=15176
 Pb^{207, 208}(γ , p) 3=15176
 Pb(γ , p), 22.5 and 33.5 MeV 3=2433
 Pb(γ , p) at 22.5 and 33.5 MeV 3=6219
 Pb²⁰⁸(γ , pn) 3=15176
 Pb²⁰⁸, giant resonance rel. to nuclear phonon excitations 3=8078
 Pb²⁰⁸, photodisintegration calc. 3=6137
 Pb²⁰⁸, photodisintegration, giant resonance 3=4619
 Pr¹⁴¹(γ , p) at 22.5 and 33.5 MeV 3=2432
 Pt(γ , p), 22.5 and 33.5 MeV 3=2433
 Pt(γ , p) at 22.5 and 33.5 MeV 3=6219
 Rh¹⁰³(γ , n), threshold to 23 MeV, rel. to giant res. splitting 3=6230
 Rh(γ , p) at 22.5 and 33.5 MeV 3=6219
 S³²(γ , n), resonances, cross-sections, 13–23 MeV 3=4616
 S³²(γ , n)S³¹, 30 MeV, cross-sections 3=8071
 S³², photoneutron and photoproton reactions 3=19832
 S³², photoproton spectrum 3=15172
 Sb, photodeuteron and photoproton yield 3=19833
 Si²⁸(γ , p), cross-section fluctuations, 17.6 MeV 3=8073
 Si²⁸(γ , π^-)P²⁸, cross-sections theory and expt. 3=2430
 Sn¹¹⁹, γ -quanta absorption at 23.8 keV 3=2431
 Sn, photodeuteron and photoproton yield 3=19833
 Ta¹⁸¹(γ , n), threshold to 23 MeV, rel. to giant res. splitting 3=6230
 Ta¹⁸¹(γ , n) and (γ , 2n), meas. 3=10329
 Ta (γ , π^0), 154 MeV 3=24762
 Tb¹⁵⁹(γ , n), threshold to 23 MeV, rel. to giant res. splitting 3=6230
 U photoelectrons, ang. distrib. 3=22366
 V(γ , α), 21 and 30 MeV 3=15179
 V⁵¹(γ , n), meas. up to 28 MeV 3=6221
 V⁵¹(γ , 2n), meas. up to 28 MeV 3=6221
 W (γ , p), excitation function, 15.5–33.5 MeV 3=24923
 W(γ , p), 22.5 and 33.5 MeV 3=2433
 Y⁸⁹(γ , n)Y⁸⁸ threshold 3=8074
 Zr⁹⁰ photodisint., giant resonance 3=6228

protons

- capture, resonance widths, graphical method 3=2453
 cascade calc., intranuclear, low-energy 3=22384
 with complex nuclei, 27 GeV 3=15187
 cosmic rays in nuclear emulsions 3=24817
 deuteron formation from 25–30 BeV protons 3=6253
 diffraction processes, rel. to π -production 3=15169
 with emulsion nuclei, 25 GeV/c, hypernuclei prod. 3=19756
 with emulsion nuclei, 26.7 GeV/c, meson prodn. 3=6249
 in emulsions, 6 GeV 3=19733
 in emulsion, 25 GeV, with heavy nuclei 3=19628

Nuclear reactions due to —contd**protons —contd**

- in emulsion, 25 GeV/c, secondary particles 3=19626
 formation of nuclei heavier than Ca 3=15185
 fragmentation at 9 GeV, ang. correl. with fragments 3=22388
 fragmentation in emulsion at 9 BeV, T-shaped hammer tracks 3=4475
 γ production, use of two-crystal spectrometer 3=7746
 heavy emulsion nuclei, Li⁸ fragment emission, frequency 3=19853
 with heavy nuclei in emulsion, 24 GeV 3=8103
 heavy nuclei—nucleon colls, hydrodynamic theory 3=2439
 high energy, photon spectra 3=8102
 inert gas production by 540 MeV proton irradiation of metals 3=12676
 medium-A nuclei, direct (p, n) reactions, meas. 3=10347
 multicharged-particle production, energy spectra and angular correl. 3=24939
 9 GeV, mechanism of primary collision 3=24938
 nuclear cascade process, 9 BeV, produced particle properties 3=2461
 nuclei A ~100, 11.2 MeV, total reaction cross-sections 3=24931
 (p, α) at (0.5–2.0) $\times 10^9$ °K for A=40–60 3=24941
 (p, α) at 30, 43 and 56 MeV 3=24936
 (p, α), differn. cross-sect., in large-angle region, variation 3=6244
 (p, d), and nuclear neutron hole state determ. 3=19762
 (p, d) at (0.5–2.0) $\times 10^9$ °K for A=40–60 3=24941
 (p, γ) resonance curve anomalies 3=12672
 (p, γ , γ) triple correl., mixing ratio sign 3=12674
 (p, n) cross-sections, optical model distorted wave analysis 3=669
 (p, n), and nuclear optical potential, isotopic spin dependence, calc., $> \sim$ MeV 3=19749
 (p, n) reactions, energy spectra, statistical model 3=2426
 (p, n) reactions, isobaric states props. 3=633
 (p, n) reactions, Q-values meas. 3=668
 (p, n), resonance peaks, correlation effects 3=8096
 (p, p) on 15 rare earth nuclides at 12 MeV, p' spectra 3=22285
 (p, 2p), on light nuclei, effect of absorpt., calc. 3=19842
 (p, 2p) and (p, np), "spectroscopic approach" for protons up to several GeV 3=2440
 p, p', correl. bet. p' polarization and photon's direction 3=15191
 (p, pn), high-energy, nuclear structure effects 3=12679
 (p, pn), 370 MeV, medium weight nuclei 3=15197
 (p, π^+), cross-section with π -meson exchange 3=4635
 (p, t) in Al and Pb 3=4637
 pickup, radioactive heavy ions detector 3=12609
 polarization effects, with spin-orbital interaction 3=22353
 scatt. cross-sections, inelastic, 10 MeV, for 19 elements 3=8095
 secondary particle ang. distrib., for 10^{10} – 10^{13} eV reactions 3=17273
 supernova envelope, nuclear synthesis in A = 20–40 3=21123
 target of T₂ or D₂-saturated Zr, temp. distrib. 3=24395
 57 MeV, spectra of emitted charged particles 3=8100
 3–28 GeV 3=10071
 A⁴⁰(p, γ)K⁴¹, at 1–1.65 keV 3=7991
 A⁴⁰(p, n)K⁴⁰ at 5.6 MeV, γ -ray spectra 3=6250
 Ac(p, α xn), cross-sections 3=6251
 Ag, formation of Na²⁴ and Mg²⁸, 320–880 MeV 3=22387
 Ag(p, Li⁸), 9 BeV meas. 3=22389
 Al, 30 GeV, prod. of t, d, p, \bar{p} , π and K 3=6090
 Al²⁷(p, α) 3=2473
 Al²⁷(p, α)Mg²⁴, ang. distrib., mechanism 3=6241
 Al²⁷(p, α)Mg²⁴, 1–25 MeV 3=19847
 Al²⁷(p, α)Mg²⁴, 3 to 12 MeV 3=17468
 Al²⁷(p, Be⁷), 30 and 39 MeV 3=22383
 Al²⁷(p, γ)Si²⁸ 3=10219
 Al²⁷(p, γ)Si²⁸ 3=24836
 Al²⁷(p, γ)Si²⁸ resonance energy 3=12672
 Al²⁷(p, γ)Si²⁸, resonances 3=2499
 Al²⁷(p, γ)Si²⁸ resonances, Monte Carlo study 3=12673

Nuclear reactions due to — contd

protons — contd

- Al²⁷(p,γ)Si²⁸ resonant energy, with absolute ion velocity gauge 3=22381
 Al²⁷(p,γ)Si²⁸, 922 keV resonance 3=8097
 Al²⁷(p,γ)Si²⁸, 992 keV resonance 3=12668
 Al²⁷(p,γ)Si²⁸, 936 and 1261 keV resonances 3=19844
 Al²⁷(p,γ)Si²⁸, 0.9-2.5 MeV 3=19811
 Al(p,n), 143 MeV, neutron polariz. 3=10349
 Al²⁷(p,p')Al²⁷, p' ang. distrib. peaks, 6.5 MeV p 3=22375
 Al²⁷(p,π⁺)Mg²⁷ 3=6247
 Al²⁷(p,π⁺)Mg²⁷, cross-section calc. 3=4635
 Al²⁷(p,3pn)Na²⁴/C¹²(p,pn)C¹¹ ratio in GeV region 3=6252
 Al²⁷(p,3pn)Na²⁴, GeV energy protons, recoil study 3=4639
 Al²⁷(p,3p2n)Na²³, 155 MeV, cross-section 3=19854
 As⁷⁵(p,α)Ge⁷², 8-14 MeV 3=24935
 Au, formation of Na²⁴ and Mg²⁶, 320-880 MeV 3=22387
 Au, Ir¹⁸⁶ formation, 660 MeV 3=24912
 Au, neutron evaporation spectra 3=12669
 Au¹⁹⁷(p,γ)nHg, 40 to 140 MeV, spallation use of Orsay isotope separator 3=12678
 Au¹⁹⁷(p,3p3n), 50-150 MeV, and nucleus, α sub-structure 3=19852
 B¹⁰(p,α)Be⁷, excitation function resonances 3=17463
 B¹⁰(p,He³)Be⁸, 4-10 MeV, excitation function, 50°, 90° 3=17463
 B¹⁰(p,n)C¹⁰, excit. function, threshold to 10.6 MeV 3=12671
 B¹¹, proton capture in giant resonance region 3=15192
 B¹¹(p,α₀), ang. distrib., 140-550 keV 3=2452
 B¹¹(p,α)Be⁸, 0.7-6.0 MeV 3=19850
 B¹¹(p,d), 17.6-20 MeV, meas. analysis 3=4636
 B¹¹(p,γ)C¹², above 25 MeV 3=17464
 B¹¹(p,n), 40 to 150 MeV 3=12677
 B¹¹(p,p'), unified model theory 3=2382
 Be⁹(p,α)Li⁸, at 15.6 and 18.6 MeV, ang. distrib. 3=2454
 Be⁹(p,γ)B¹⁰, 336 keV resonance 3=667
 Be⁹(p,n)B⁹, 2.4-4.1 MeV, neutron polariz. and ang. distrib. 3=6243
 Be⁹(p,n)B⁹, 3.7-8.5 MeV 3=19848
 Be, 30 GeV, prod. of t, d, p, \bar{p} , π and K 3=6090
 Bi, α emission, 60-600 MeV, and nuclear struct. 3=17381
 Bi, prod. of At²⁰⁹ and At²⁰⁷ by 120-660 MeV protons 3=15203
 Bi²⁰⁹, 135 MeV, calc. including fission 3=4638
 Bi(p,α), 240-600 MeV, cross-sections 3=22385
 Bi²⁰⁹(p,xn)Po²⁰⁰⁻²⁰⁸ spallation, 135 MeV 3=10348
 Bi(p,xn)Po, 57-155 MeV, 4 Po isotopes 3=19851
 Bi²⁰⁹(p,pxn) spallation products, recoil 3=17475
 Bi²⁰⁹(p,pn)Bi^{208m}, 19.2 MeV 3=2457
 Br(p,Li⁶), 9 BeV meas. 3=22389
 Br⁷⁹(p,n) cross-section at 6.75 MeV 3=12675
 Br^{79,81}(p,pn) at 2.9 GeV 3=12679
 C(p,ππ) 3=4388
 C¹² nuclei at 660 MeV, intranuclear cascade 3=4643
 C¹², 660 MeV, rel. to α-particle cascade 3=2462
 C¹²(p,α)B⁹, at 15.6 and 18.6 MeV, ang. distrib. 3=2454
 C¹²(p,d)C¹¹, at high energy, nucleon momentum distrib. 3=624
 C¹²(p,d)C¹¹, E_p = 14-20 MeV 3=2447
 C¹²(p,γ)N¹³ 3=12666
 C¹²(p,γ₀)N¹³ 3=12666
 C¹²(p,γ)N¹³, 1.5 to 2.0 MeV 3=17465
 C¹²(p,γ)N¹³, E_p = 14-20 MeV 3=2447
 C¹²(p,γ)N¹³, 10 to 50 MeV 3=19846
 C¹²(p,p'3α), 15-29 MeV 3=2458
 C¹²(p,p'3α), 15-29 MeV, mechanism 3=8091
 C¹²(p,p')3α, low-lying states in Li⁶ and Be⁸ 3=10345
 C¹²(p,2p)B¹¹ 3=6277
 C¹²(p,2p), unified model theory 3=2382
 C¹²(p,2p), 155 MeV, calc. 3=19842
 C¹²(p,pn)C¹¹, at 0.25-6.2 GeV, recoil ranges 3=670
 C¹²(p,pn)C¹¹, for synchrocyclotron current meas. 3=14700
 C¹²(p,pn)C¹¹/Al²⁷(p,3pn)Na²⁴ ratio in GeV region 3=6252
 C¹³(p,α)B¹⁰, α-particle detect. by semicond. counter 3=4478
 C¹³(p,γ)N¹⁴, rel. to N¹⁴ levels 3=8094
 C¹³(p,γ)N¹⁴ resonance energy 3=12672
 C¹³(p,γ)N¹⁴, in stars, effect of possible N¹⁴ level ~ 7.60 MeV 3=11566

Nuclear reactions due to — contd

protons — contd

- C¹³(p,n)N¹³, forward and backward peakings 3=12659
 C¹⁴(p,α)B¹¹, at 18 MeV, ang. distrib. 3=671
 C¹⁴(p,d) and C¹⁴(p,t), 17.6-20 MeV 3=4636
 Ca(p,γ), 150 MeV 3=10350
 Ca⁴⁰(p,γ)Sc⁴¹, rel. to final state nuclear density distrib. 3=19745
 Ca⁴²(p,γ)Sc⁴³, 780-1420 keV p's, resonances 3=17471
 Ca⁴⁴(p,γ)Sc⁴⁶, 800-1400 keV p's, resonances 3=17470
 Ca⁴⁸(p,n), 120-660 MeV 3=15201
 Ca⁴⁸(p,2n), 120-660 MeV 3=15201
 Ca⁴⁸(p,pn), 120-660 MeV 3=15201
 Ca⁴⁸(p,pn), (p,2n) and (p,n), 120-660 MeV 3=10351
 Cl(p,γ), 150 MeV 3=10350
 Cl³⁵(p,n)Ar³⁶ thresholds meas. 3=8131
 Co⁵⁹(p,α)Fe⁵⁶, 22 MeV 3=15196
 Co⁵⁹(p,n), 6.5 MeV direct processes 3=12667
 Cs¹³³(p,3n)Ba^{133m} 3=8000
 Cu, formation of Na²⁴ and Mg²⁶, 320-880 MeV 3=22387
 Cu, spallation, 3-30 GeV 3=4641
 Cu^{63,65}(p,α), 8-14 MeV 3=24935
 Cu⁶³(p,n) cross-section at 6.75 MeV 3=12675
 Cu⁶⁵(p,n) cross-section at 6.75 MeV 3=12675
 Cu⁶⁵(p,n), 40 to 150 MeV 3=12677
 Cu⁶⁵(p,pn) at 2.9 GeV 3=12679
 F¹⁹(p,α)O¹⁶ 3=6244
 F¹⁹(p,α)O¹⁶, 3-12 MeV meas. 3=22379
 F¹⁹(p,α)O¹⁶, < 35 MeV, α ang. distrib. peaks near 180° 3=17459
 F¹⁹(p,n)Ne¹⁹ 3=668
 F¹⁹(p,n)Ne¹⁹, 5 to 11 MeV 3=17466
 F¹⁹+p, 483-597 keV, resonances 3=15193
 Fe, by 6.2 BeV protons, Ar³⁶/C¹³ ratio 3=4491
 Fe, 30 GeV, prod. of t, d, p, \bar{p} , π and K 3=6090
 Fe⁵⁴(p,γ)Co⁵⁵, 770-1100 keV 3=17472
 Fe⁵⁶(p,α)Mn⁵³, up to 14.5 MeV 3=24934
 Fe⁵⁷(p,d)Fe⁵⁸, 22 MeV 3=15196
 Fe⁵⁸(p,t)Fe⁵⁸, 22 MeV 3=15196
 Ga^{69,71}, 13-56 MeV, excitation functions 3=17474
 Ga⁶⁹(p,n) cross section at 6.75 MeV 3=12675
 Ga⁷¹(p,n) cross-section at 6.75 MeV 3=12675
 Gd¹⁶⁰(p,p2n)Gd^{158m} 3=6173
 Ge⁷⁰(p,pn) at 2.9 GeV 3=12679
 Ge⁷²(p,pn)Ge^{71m}, 19.2 MeV 3=2457
 Ge⁷²(p,pn) at 2.9 GeV 3=12679
 In¹¹⁵(p,n)Sn¹¹⁵ 3=8098
 In(p,π⁺) meas. at 30 and 2.9 GeV 3=2460
 In(p,pxn) meas. at 30 and 2.9 GeV 3=2460
 K(p,γ), 150 MeV 3=10350
 K³⁹(p,γ)Ca⁴⁰ γ,γ correl. and Ca⁴⁰ spin, 2, 3, 4th excited states 3=19776
 La¹³⁹(p,n), 40 to 150 MeV 3=12677
 Li(p,n), 143 MeV, neutron polariz. 3=10349
 Li⁶ and Li⁷, quasi-free p-p scatt. 3=15190
 Li⁶(p,α)He³, 130-530 keV, He³ ang. distrib. 3=12664
 Li⁶(p,α)He³, up to 5 MeV 3=17460
 Li⁶(p,2p)He³, 155 MeV, quasifree p-p scatt. 3=24942
 Li⁶(p,pd), 155 MeV, calc. 3=22386
 Li⁷(p,α)He⁴, with polarized protons 3=2459
 Li⁷(p,α)He⁴, 1.12 to 3.58 MeV 3=8099
 Li⁷(p,α)He⁴, 3.0 to 5.5 MeV 3=17461
 Li⁷(p,α)He⁴, 3.3-6.6 MeV 3=6245
 Li⁷(p,α)He⁴, at 15 and 18.6 MeV, ang. distrib. 3=2454
 Li⁷+p, 441 keV γ's, for studying cross-section fluctuations 3=8072
 Li⁷(p,γ)Be⁸, above giant resonance energies 3=17464
 Li⁷(p,γ)Be⁸, 1.5-11 MeV, excitation curve 3=22378
 Li⁷(p,γ)Be⁸, 2.5 to 9 MeV 3=19845
 Li⁷(p,n), background neutron scatt. from Ta backing of target 3=2472
 Li⁷(p,n)Be⁷, n polariz., ang. distrib., E_p = 4.5 MeV 3=174
 Li⁷(p,n)Be⁷, neutron threshold energy, Q-value 3=10346
 Li⁷(p,n)Be⁷ threshold energy, with absolute ion velocity gauge 3=22381
 Li⁷(p,n)Be⁷, 4.3 MeV 3=8089
 Li⁷(p,n)Be⁷, 3-13 MeV 3=10341
 Li⁷(p,2p)He³, 155 MeV, quasifree p-p scatt. 3=24942
 Li⁸ fragment formation cross-section, emulsions, Nikfir, at 9BeV 3=15200

Nuclear reactions due to —contd

protons —contd

- Mg²⁴(p,γ) 825 keV reson., Al²⁵ 450 keV level excitation 3=22296
 Mg²⁴(p,γ)Al²⁵, 1.49 MeV reson., and Al²⁵, 3.70 MeV level, spin 3=19772
 Mg²⁵(p,γ) 1 MeV, Al²⁶ 418 keV level excitation 3=22296
 Mg²⁵(p,γ)Al²⁶ 3=19773
 Mg²⁶(p,α)Na²³ 3=17467
 Mg²⁶(p,γ)Al²⁷ 3=4567
 Mg²⁶(p,γ)Al²⁷, at 0.2-3.0 MeV, 80 new resonances 3=24933
 Mn⁵⁵(p,n) cross-section at 6.75 MeV 3=12675
 Mn⁵⁵(p,n), low energy, and Fe⁵⁵ levels 3=17473
 Mo(p,n), (p,d), (p,pn), (p,2p), 11.2 MeV 3=22382
 Na²³(p,α)Ne²⁰, 100-450 keV meas. 3=22380
 Na²³(p,α)Ne²⁰, 3-12 MeV 3=19849
 Na²³(p,γ)Mg²⁴, resonances 300-800 keV 3=12670
 Na²³(p,n)Mg²³, Q values 3=668
 Nb⁹³(p,α)Zr⁹⁰, 22 MeV 3=15196
 Nb⁹³(p,n)Mo^{93m}, for analysing Nb in Ta foil 3=8992
 Nb⁹³(p,3p3n), 50-150 MeV, and nucleus, α sub-structure 3=19852
 Nd¹⁴²(p,2n)Pm^{141m} 3=6173
 Ne²⁰(p,γ)Na²¹, rel. to final state nuclear density distrib. 3=19745
 Ne^{21,22}, resonance energies for capture, 600-1400 keV 3=4634
 Ni, neutron evaporation spectra 3=12669
 Ni⁵⁸(p,γ)Cu⁵⁸, resonance energy 3=12672
 Ni⁵⁸(p,γ)Cu⁵⁸ resonances, Monte Carlo study 3=12673
 Ni^{58,60}(p,α), up to 14.5 MeV 3=24934
 Ni⁶², (p,p'γ-γ) ang. correl. meas. 3=17408
 Ni⁶⁴(p,γ)Cu⁶⁴, γ's and Cu⁶⁴ levels 3=12589
 O¹⁶, Li^{6,7} prod., 156 MeV 3=15199
 O¹⁶, spallation, 20-150 MeV meas. 3=4642
 O¹⁶(p,d), 17.6-20 MeV, meas. analysis 3=4636
 O¹⁶(p,γ)F¹⁷, rel. to final state nuclear density distrib. 3=19745
 O¹⁶(p,α) 3=2451
 O¹⁶(p,p'4α), 15-29 MeV 3=2458
 O¹⁶(p,3p3n), 50-150 MeV, and nucleus, α sub-structure 3=19852
 O¹⁸(p,α)N¹⁵, 2.2-6 MeV 3=12584
 O¹⁸(p,α)N¹⁵, 730-1050 keV, ang. distrib. 3=24932
 O¹⁸(p,d) and O¹⁸(p,t), 17.6-20 MeV 3=4636
 O¹⁸(p,γ)F¹⁹, 570-1500 keV 3=19843
 Os¹⁸⁸(p,2n)Ir^{187m} 3=24911
 Os¹⁹⁰(p,2n)Ir^{189m} 3=24911
 P³¹(p,γ)S³², giant reson. structure 3=22376
 P³¹(p,γ)S³², low energy resonances 3=6242
 P³¹(p,γ)S³² and S³² energy levels, 640-1150 keV 3=22377
 P³¹(p,γ)S³², 355, 440, 540 keV 3=7989
 P³¹(p,γ)S³², 355 and 439 keV resonances 3=8090
 Pb, prod. of At²⁰⁹ and At²⁰⁷ by 120-660 MeV protons 3=15203
 Pb²⁰⁸(p,n)Bi^{208m}, 19.2 MeV 3=2457
 Pb²⁰⁸(p,2n)Bi²⁰⁹ in Discoverer 17 by solar protons 3=7951
 Pb²⁰⁷(p,3n)Bi²⁰⁸ in Discoverer 17 by solar protons 3=7951
 Pb²⁰⁸(p,4n)Bi²⁰⁹ in Discoverer 17 by solar protons 3=7951
 Pr¹⁴¹(p,2n)Nd^{140m} 3=6173
 Rh, neutron evaporation spectra 3=12669
 Rh¹⁰³(p,α)Ru¹⁰⁰, 8-14 MeV 3=24935
 S³⁴, γ-ray spectra, from proton capture at 1214 keV 3=8087
 S³⁴(p,γ)Cl³⁵, 800-1400 keV p's 3=17469
 Sc⁴⁵(p,γ)Ti⁴⁶, resonances, γ-decay 3=10344
 Sc⁴⁵(p,γ)Ti⁴⁶, 900-1400 keV 3=12665
 Sc⁴⁵(p,n) cross-section at 6.75 MeV 3=12675
 Se⁷⁶(p,pn) at 2.9 GeV 3=12679
 Si²⁸+p, resonance levels, reduced widths 3=15194
 Si²⁸(p,γ)P³⁰ at 6.847 MeV 3=2456
 Si²⁸(p,γ)P³⁰, E_γ = 1375 and 1500 keV resonances 3=6246
 Si³⁰(p,γ)P³¹ 3=15195
 Si³⁰(p,γ)P³¹, γ polarization, from photoproton tracks in emulsion 3=8088
 Si³⁰(p,γ)P³¹, γ-ray spectra at reson. between 1 and 2.7 MeV p energy, and P³¹ levels 3=12586
 Si³⁰(p,γ)P³¹, 1177 to 1509 keV 3=19774
 Sm¹⁴⁷(p,2n)Eu^{146m} 3=6173
 Sn¹²⁰(p,α), formation of In¹¹⁷, In^{117m} 3=8092

Nuclear reactions due to —contd

protons —contd

- Sn¹²⁰(p,α)In^{117,117m}, theory 3=8093
 Sr⁸⁸(p,n), 40 to 150 MeV 3=12677
 Sr⁸⁸(p,n)Y^{88m}, 19.2 MeV 3=2457
 Ta, neutron evaporation spectra 3=12669
 Ta + p, Lu¹⁷³, Lu¹⁶⁹ + Lu¹⁷⁰, conversion electron spectra 1020-3200 keV 3=12641
 Ta + p, 660 MeV, and Tm¹⁶², Yb¹⁶² decay, β⁺ conversion 3=22345
 Te^{125,126}(p,2pxn), 120 to 660 MeV 3=15202
 Te^{125,126}(p,xn), 120 to 660 MeV 3=15202
 Te¹³⁰(p,pn)Te^{129,129m} 60-233 MeV, excit. function 3=6248
 Te¹³⁰(p,2p)Sb¹²⁸, 60-233 MeV, excit. function 3=6248
 Th, spallation, α-particle emission 3=6251
 Ti, capture, γ-rays, low energy, and V^{48,50} levels 3=17406
 Ti⁴⁸(p,n)V^{48m}, 19.2 MeV 3=2457
 Ti⁴⁷(p,n)V⁴⁷ 3=12587
 U, formation of Na²⁴ and Mg²⁸, 320-880 MeV 3=22387
 V (p, xpyn), up to 84 MeV 3=24937
 V⁵¹(p,Be⁷), 33 and 39 MeV 3=22383
 V⁵¹(p,n) cross-section at 6.75 MeV 3=12675
 V⁵¹(p,n), at 12.1 MeV 3=2455
 V⁵¹(p,n), 40 to 150 MeV 3=12677
 V⁵¹(p,3p3n), 50-150 MeV, and nucleus, α sub-structure 3=19852
 Y(p,n), (p,d), (p,pn), (p,2p), 11.2 MeV 3=22382
 Y⁸⁹(p,pn)Y^{88m}, 19.2 MeV 3=2457
 Zn⁶⁶(p,pn) at 2.9 GeV 3=12679
 Zr⁹⁰(p,d)Zr⁸⁹, nuclear states, obs. 3=17395
 Zr⁹¹(p,d)Zr⁹⁰, 22 MeV 3=15196
 Zr⁹²(p,t)Zr⁹⁰, 22 MeV 3=15196
 Zr⁹⁰(p,n)Nb^{90m}, 19.2 MeV 3=2457
 Zr⁹⁰(p,n)Nb⁹⁰, 6.9-11.2 MeV, excitation function 3=24931

tritons

- Al²⁷(t,n), neutron yield and ang. distrib. 3=4673
 C¹²(t,α)B¹¹, 0.3-1.2 MeV 3=24982
 C¹²(t,n), at 0.35-2.4 MeV 3=4672
 C¹²(t,p)C¹⁴, 0.32 to 1.18 MeV 3=15237
 F¹⁹(t,α)O¹⁸, energy level det. of O¹⁸ 3=637
 F¹⁹(t,n), neutron yield and ang. distrib. 3=4673
 H¹(t,n)He³, as neutron source 3=24742
 He³, α-particle and proton spectra 3=7939
 K³⁹(t,α)Ar³⁸, 5.48 MeV 3=10256
 O¹⁶(t,p)O¹⁸, O¹⁸(t,p)O²⁰, energy level det. of O¹⁸, O²⁰ 3=637
 O¹⁶(t,p)O¹⁸, ang. distrib., t of 660-1400 keV 3=19887
 O¹⁶(t,p)O¹⁸, 5 MeV, two-nucleon stripping 3=10392

X-rays

See Nuclear reactions, photons.

Nuclear reactors

- handbook 3=2146
 review, historical account 3=2512

fission

- accidents, and escaped fission products, for various operating powers 3=8162
 age-diffusion theory, adjoint functions and orthogonality rels. 3=11666
 ammonium salts as moderators for cold neutron sources 3=6010
 "Anna", 2nd Polish, critical assembly 3=25013
 "Anna", 2nd Polish exptl., critical assembly 3=691
 asymptotic reactor theory, slab systems 3=2526
 BEPO, transfer junction model for control studies 3=12729
 bang-bang control, boiling moderator reactors 3=19906
 boiling-water type, dynamic model 3=25016
 Boltzmann eqn., energy-depend., transport approx. 3=12463
 Boltzmann eqn., monoenergetic, variational analysis 3=18755-6
 calorimeter, for high radiation fields 3=12740
 CANDU-type power reactor, neutron temp. 3=25030
 CANDU type, neutron slowing-down spectrum 3=25031
 cell calcs. in cylindrical geometry, effect of zero gradient boundary conditions 3=6322
 ceramic fuel pin, transient heat transfer 3=17514
 chain reactions, analogy with vibrating systems 3=4680
 channel temp. field and thermoelastic stress in element shell 3=4681

Nuclear reactors — contd

fission — contd

chemical reactions, use for 3=6924
 codes for computers 3=17508
 collision density at epithermal energies 3=12525
 concrete shielding constns. 3=17516
 control element linear extrapolation distance, improvements on Milne solution 3=22449
 control-rod burn-up 3=4695
 coolant temp. coeff. and two-thermal group diffusion model 3=15259
 cooling efficiency rel. to props. of cooling gas 3=694
 core physics and kinetic studies 3=24997
 critical equation, theory 3=22446
 critical mass calc., anisotropic diffusion coeff. 3=10415
 critical size and flux distrib. at power level 3=12722
 Dancoff correction, several infinitely long cylindrical rings 3=10413
 Dancoff correction, fuel rods with air gaps 3=6337
 delayed-neutron fractions, effective, meas. 3=19904
 describing function of a supercritical reactor 3=8159
 detector weighting functions 3=22443
 DFR, coolant, impurity content reductn. 3=2541
 DFR, operation, safety assessment 3=2540
 DIDO, calc. of radiation dosage rates 3=2515
 Dido (FRJ-2), kinetics 3=15262
 DIDO, neutron diff. equipment 3=7869
 diffusion anisotropy, singly and doubly periodic lattices 3=6324
 diffusion theory flux peaking at sharp corner 3=15255
 dimethyl acetylene as moderator for cold neutron sources 3=6010
 discrete ordinate quadratures for thin slab cells 3=6326
 Doppler broadening of cross-sections 3=10418
 dynamic parameters, statistical estimation 3=693
 EBR-2, reactor system, fuel, control 3=2517
 effective resonance surface, formulation 3=2524
 encyclopaedia of nucl. energy 3=4285
 epithermal, control rod worths 3=15266
 epithermal neutron spectrum, meas. 3=25026
 fast breeders, liq.-Na cooled, friction of immersed metals 3=1249
 fast group constants, variational procedure for calculation 3=25003
 fast neutron flux meas. 3=10430
 fast, Pu-fuelled, breeding ratios, costs 3=22458
 fast reactor for sea-water distillation 3=19902
 fast, with low fuel concns., projected 3=2523
 fast, world survey in tabular form 3=6319
 feedback dynamics, using elec. analogue 3=10426
 fine flux meas., analysis in concentric annuli fuel elements 3=10409
 fins, triangular, temp. distrib. and heat flow 3=3908
 first-collision probabs. for linearly anisotropic flux distrib. 3=25009
 flux distrib. during fuel burnup, analysis 3=24998
 FRJ-1 Merlin, critical masses for core configs. 3=4692
 FRJ-1 Merlin, neutron flux distrib. 3=4691
 fuel behaviour when coolant boils 3=4689
 fuel clusters, resonance integral calc. 3=2514
 fuel elements, neutron spectral shift eval. 3=2525
 fuel elements, polyzonal spirial, heat transfer 3=4698
 fuel element, thermal neutron spectrum 3=10408
 fuel, irradi., power and burn-up, meas. 3=19907
 fuels, review 3=17513
 fuel rods, evolution of UO_2 structure during irradiation 3=25650
 fuse, using improved heat-transfer surface 3=16817
 gamma radiation due to extended source 3=2522
 gas-cooled (AGR), symposium, London (1963) 3=22444
 gas-cooled power reactors, raising efficiency 3=8163
 gas-cooled, thermal parameters, optimization 3=17512
 gaseous, for space-ship propulsion 3=21138
 generalized variational method of analysis 3=6327
 graphite lattices, mixed, reactivity and reaction rates 3=22448
 graphite, neutron-irradiated, microstructural changes 3=25651
 graphite, Pile Grade, 450°C, irradi. damage 3=10433

Nuclear reactors — contd

fission — contd

graphite-thorium moderators, resonance shielding 3=25028
 group diffusion eqns., cylindrical flux trap assembly 3=19901
 heat-producing elements, cylindrical, temperature field 3=10411
 heavy water, Chinese, at Peking 3=25025
 heavy water, USSR Acad. Sci. 3=25023
 heavy-water manufacture, Sweden 3=4688
 heavy water moderated reactor, theory, with appl. to FRJ-2 3=8164
 heavy-water-moderated power reactors, invest. for Swedish programme 3=6330
 heavy-water pressure tube reactor, shielding 3=19903
 HERO, thermocouple calibration by gas thermometer 3=284
 heterogeneous, cylindrical fuel elements 3=10416
 heterogeneous, space depend. neutron spectra 3=8157
 Hifar (Australia) thermal spectrum 3=3289
 high flux, Xe poisoning calcs. 3=4696
 homogeneous boiling reactor, stability 3=10429
 impulse power meas. with Cherenkov radiation 3=12732
 in-core neutron flux meas. 3=22452
 Indian Point, pressurized-water 3=25015
 infinite cylinders, linear extrapolation length and blackness 3=10405
 irradiation behaviour of graphite 3=25027
 Italian, "Enrico Fermi" of Seln 3=6329
 kinetics of low source startups 3=25005
 kinetics when reactivity linear function of time 3=25000
 lattice cells of n media, first-collision probabs. 3=15280
 lattices, sandwich, and Block's theorem 3=12728
 Magnox AL 80 and ZR 80, fatigue behaviour at high temp. 3=25762
 Magnox AL 80, effect of Be on exaggerated grain growth 3=25760
 Magnox ZR 55, mech. props., effect of H_2 pick-up 3=25761
 materials, Mg/MgO sintered 3=15268-9
 materials, radiation effects, conference, Venice (1962) 3=10697
 materials, radiation effects, conference, Venice (1962) 3=6547-8
 Merlin, Dido, AVR at Jülich 3=8165
 Merlin, shielding calc. 3=2516
 Merlin, tank, radiation dose level 3=4690
 metals, aqueous corrosion, review 3=695
 metals, pure, damage rel. to neutron flux 3=2847
 Mg-Zr alloys, heat treatment in H_2 for creep ductility improvement 3=25763
 Mg-Zr alloy ZA, creep at 400° and 450°C in CO_2 3=25629
 moderator coeffs. rel. to model and cross-sections 3=8151
 moderator—cylind. fuel system, first-flight collision probab. 3=19911
 moderator, liquid, radiation nucleation of bubbles 3=23864
 moderators and absorbers, abs. cross-sect. of free proton model 3=22460
 multiplication parameters η , meas., from Xe poisoning 3=25008
 multiplying assembly, probab. distrib. 3=10404
 neutron beam producer, intense 3=22450
 neutron chain reactions, statistical theory 3=12717-18-19
 neutron data for reactor kinetics 3=17509
 neutron decay in subcritical assembly 3=12727
 neutron distribs., statistical fluctuations 3=2528
 neutron effective reson. integral meas. on U and Th 3=2544
 neutron energy spectra, rel. to displacement damage 3=17517
 neutron fluctuations, cellular structure reactor 3=10412
 Neutron flux at a point, Monte Carlo estimation 3=24739
 neutron flux flattening in large and small reactors 3=4688
 neutron flux meas., Dy foils 3=2283
 neutron flux meas., P—polythene mixtures 3=2284
 neutron flux in polyethylene moderated medium 3=19908
 neutron flux and spectrum meas. 3=19912

Nuclear reactors — contd**fission — contd**

- neutron and γ -ray data 3=17510
- neutron intensity meas. with Au and S probes 3=25018
- neutron kinetic eqns., standard curves 3=10417
- neutron kinetics in nonmoderating assemblies 3=17287
- neutron kinetics simulation with RC network 3=10406
- neutron net current in asymmetric thin regions 3=4683
- neutrons and precursors in multiplying medium, probability distrib. 3=25002
- neutron pulse in moderators, theory 3=25004
- neutron resonance absorpt. in lumps with nonunif. temp. distrib. 3=6323
- neutron slowing-down in water, rel. to inelastic scattering in U 3=2275
- neutron telescope monitors 3=6331
- neutron temp. distrib. in cylinder of hot moderator 3=25001
- neutron temp. meas. by Lu activation 3=22461
- neutron thermalization, characterization 3=2527
- neutron thermalization, time decay consts. 3=8167
- neutron thermalization in lattice, theory 3=10410
- Neutron time-dependent thermalization problem 3=24738
- neutrons in water, slowing down time scale 3=22148
- noise analysis 3=12733
- noise parameters, statistical estimation 3=693
- NPD, operation 3=15264
- one group diffusion theory rel. to Yankee startup exptl. data 3=2520
- ORGEL lattices, natural buckling, crit. expts. 3=2519
- parameters det., variance to mean neutron no. ratio 3=2521
- pebble-bed core, coolant flow temp. distrib. 3=22451
- pebble-bed, gas-cooled, flow and temp. field 3=10414
- period meter, fed from ionization chamber
- tune response during startup transients, computer calc. 3=12741
- period meter, fed from pulse counter, time response during startup transients, computer calc. 3=12742
- pile oscillator, neutron-nucleus cross-section detm. method 3=25007
- physics and technique, Conference, Bucharest 1961 3=19900
- PM1, pressurized water reactor 3=15263
- porous solid fuels, swelling interpret. 3=2543
- power determination by means of "noise" 3=4694
- power, fuel, for 200 reactors 3=17506
- power meas., from γ activity of coolant 3=25032
- power meas., Cherenkov detectors 3=12739
- power oscillations in the prompt critical region 3=8160
- power plant, thermodynamic cycle parameters 3=2513
- power sources for space vehicles 3=21144
- power, Xe concn. calc. 3=10424
- pressurized water, Ag-In-Cd as control rod 3=6336
- pressurized water reactor, internal reloading unit 3=25012
- pulsed neutron experiments, theory 3=25006
- pulsed n. experiment evaluation, use of prompt and delayed ns 3=19910
- radiation damage experiments, analysis, Monte Carlo calculations 3=10403
- radiation dosimetry, isothermal calorimeter 3=696
- random fluctuations, digital analysis by TIMTAPE and DEUCE 3=14
- react. equation for a core with a re-entrant corner 3=8161
- reactivities, low meas. by source modulation 3=15257
- reactivity and kinetic relations 3=17507
- reactivity meas., FRJ-1 Merlin 3=15261
- reactivity, transistorized analogue computer 3=4685
- reactor materials and radiation damage, conference 3=12716
- reflected reactor, flat thermal flux distrib. in core 3=10407
- relation between k_{∞} and k_{eff} , direct deriv. 3=22447
- removal cross-sections bet. overlapping thermal groups 3=2530
- resonance integral, cylindrical rods of U metal and oxide 3=4687
- resonance integral, effective, dependence on moderator slowing-down properties 3=8156

Nuclear reactors — contd**fission — contd**

- resonance integrals, effective in statistical region, calc. 3=692
- for rocket propulsion 3=16434
- rock vessel reactor power plant, 235 MW 3=4684
- Rosendorf reactor, operational experience 3=25024
- screening meas. for type WWR-S 3=25019
- shield, power-producing 3=22454
- shielding calc., hydrogen-free "removal cross-section" method 3=17515
- shielding damage due to fast neutrons, determ. by dosimeter 3=10423
- shielding materials, review 3=2539
- shielding, model experiments 3=4693
- shielding, two and three-group calcs. 3=17511
- shut-down circuits 3=10425
- shut-down reactor as strong γ -ray source 3=25014
- Sizewell reactor transients 3=22455
- slab geometry, disadvantage factors, conveyance improvement 3=12724
- slab lattices, epithermal flux 3=15254
- sodium graphite reactor programme 3=2542
- Soviet research reactor SM, 50 MW, design 3=10421
- spatial dynamics, transfer function synthesis 3=2531
- spatial stability criteria 3=15256
- spectrum analyser, 10^{-3} –30 c/s 3=24161
- split core, slow-neutron spectrum meas. 3=6334
- square lattices, two-group plane boundary conditions 3=8154
- SRE prompt power coeff. 3=6333
- startup of low source reactors, neutron kinetics 3=12734-5
- steam generating, fog flow conditions 3=10420
- stochastic kinetics 3=2529
- subcritical assembly, description 3=25011
- subcritical reactivity meas. by source-jerk method 3=8153
- subcritical D_2O U lattices, pulsed neutron expts. 3=19909
- subcritical, reactivity meas. 3=10428
- suspension, stability theory 3=22445
- technology, advances, book 3=2511
- temperature coeffs., effect of reflector 3=12720
- theory, two-group, modification, additional group 3=24999
- thermal flux perturbs., probe-induced 3=12726
- thermal neutron spectra in lattices, ang. depend. 3=12723
- thermal neutron spectrum, integral eqn. 3=12721
- thermal, Pu fuel cycles 3=22459
- thermal utilization, flux ratios, in complex lattices 3=8158
- thermodynamic cycle, optimum, approx., power station 3=6321
- transfer cross-section between overlapping thermal groups 3=8168
- transient operation, by analogue VVR-S 3=25022
- transients, space-independent kinetics, exact theory 3=6328
- TRIGA Mark II, prompt temperature coefficient, Pu conversion effect 3=12731
- two-dimensional theory, analytic approach 3=6325
- vel. depend. neutron transport with high-energy sources 3=10126
- VVR-S, exptl. reactor 3=12730
- VVR-S, neutron temp. distrib. meas. 3=25017
- VVR-S, pile oscillator method problems 3=25021
- VVR-S, reactivity variations 3=25020
- water-moderated critical system type ZR-1 3=25010
- water, radiolysis 3=15265
- water reactors for power generation, symposium 3=10402
- Wigner's contributions to theory and technology 3=6320
- Zebra, zero power fast reactor 3=2518
- zero-energy, fast neutron flux meas. 3=22149
- $Cd_2Ta_2O_7$ as control material 3=4699
- D_2O -cooled, temp. transients of outlet water of fuel element 3=4697
- H_2O - D_2O moderating mixture 3=6335
- Na-cooled, release of fission products 3=21007
- Na, molten, heat transfer in staggered tube bank cross-flow 3=16816
- Pu thermal reactor, neutron study 3=10422

Nuclear reactors — contd
fission — contd

- PuC, 42-60 at.% C, fuel, prep. and props. 3=10431
- Ti and Fe containers for irradiated samples 3=19905
- U/graphite cells, fast neutron effects 3=10419
- U-graphite fuels, fission products loss 3=12737
- U-monoisopropylidiphenyl lattice, subcritical, n spectrum 3=25029
- U-H₂O lattice, sub critical, n spectrum 3=25029
- U²³⁵ fast breeder, effect of Pa²³³ build-up 3=6332
- U²³⁵ fuel for AETR critical expts. 3=15287
- U²³⁵ burn-up, effect of temp., by-products 3=2534
- U²³⁸ foils, bare and Cd-covered, activation 3=8166
- UO₂ fuel elements, temp. distrib. 3=10432
- Xe spatial oscill., flux threshold 3=4682

fusion

- electron density, by interferometry, in Sceptre IV 3=5679
- ionization and dissociation using e.m. fields only 3=14516
- plasma, D, cyclotron heated, mag. mirror, n energy spectrum 3=19913
- Sceptre, electron-flux X-ray film, calibration 3=2068
- Stellarator, charged-particle motion 3=21940
- stellarator, interchange instability 3=19284
- Stellarator, model C, symmetrized 3=19269
- thetatron, reversed field heating, calc. 3=413
- Zeta, absolute intensity spectral calibr. 3=16767
- Zeta-type device, ion energy 3=1999

Nuclear spallation

- α -particle emission, cross-sections for Ac isotopes 3=6251
- angular correl. with fragments due to 9 GeV protons 3=22388
- yield cross-sections calc. 3=8058
- Al, by protons 660 MeV; Be⁷ yields 3=8150
- Au¹⁹⁷ by protons, 40 to 140 MeV, use of Orsay isotope separator 3=12678
- Co product in Ni, by 3BeV protons 3=8101
- Cu, by protons, 3-30 GeV 3=4641
- Bi²⁰⁹, by p, 135 MeV, Po²⁰⁰⁻²⁰⁸ 3=10348
- Cr⁵¹, product in Fe by 3BeV protons 3=8101
- Cu, by protons, 660 MeV, Si³¹ and P³² yields 3=8150
- Fe, by 150 MeV protons 3=24940
- Fe target by protons, 3BeV, products 3=8101
- Fe⁵⁶ product in Fe by 3BeV protons 3=8101
- Mn⁵⁵ product in Fe by 3BeV protons 3=8101
- O¹⁸, by protons, 20-150 MeV meas. 3=4642
- O¹⁸(π^+ , n) [Li⁶+Be⁷] 3=6279
- Sb, by protons, 660 MeV; Be⁷, F¹⁸, Na²⁴, Mg²⁸, Si³¹, P³² yields 3=8150

Nuclear track emulsions

- use in β -spectroscopy 3=17252
- charge determination for relativistic particles 3=14841
- charged particles of different masses, discrim. 3=4304
- damp effects, α , track lengths 3=19535
- depth gauge for tracks 3=2181
- drying speed effect on granular props. 3=12381
- elec. conductivity rel. to photochem. sensitivity 3=3899
- electrons, knock-on, prod. by 26 GeV protons 3=4387
- electron scatt., multiple, calc., by c.g. and sum method 3=24567
- emulsion chambers, effect of hydrogenous impregnation 3=24571
- fading phenomena 3=14845
- field curvature as systematic errors source 3=12379
- heavy fragments identification method 3=12380
- identification of tracks, photometric device 3=24573
- ionization loss, relativistic electrons, radiation correction 3=7826
- ionization meas. on very steep tracks 3=22047
- K⁻ mesons interaction, at 500 MeV/c 3=603
- latent image fading, Fuji ET-7A, ET-6B, due to oxidation 3=14840
- magnet, high-field, 200 kG, pulsed 3=21934
- μ^- meson scattering, elastic 3=6028
- multicharged-particle interaction, with emulsion nucleus 3=24985
- neutron dosimetry, with increased gelatine 3=24569
- nucleon interact. with heavy nuclei at $>10^{12}$ eV 3=4382
- particle momenta, accuracy of determinations in strong magnetic field 3=24572

Nuclear track emulsions — contd

- particle momentum meas., high energy diffusion separation 3=24668
- photograph study, cathode ray tubes 3=12242
- π -meson prod. by 9 GeV protons 3=596
- proton-deuteron discrim. by grain counting 3=4304
- proton interactions at 25 GeV, meas. 3=7847
- radiograms, auto, quantitative, possibilities 3=17158
- R-type, sensitivity and development centres, size and structure 3=2180
- scanning device, automatic, for collimated beam 3=17160
- scattering, multiple, at large cell-sizes 3=14844
- semi-automatic meas. 3=19536
- sensitivity change during irradi., possibility 3=4303
- sensitivity, -200° to +30°C, β, γ, α photons 3=14839
- spark chambers for entrance coord. meas. 3=17159
- spurious scattering, causes of 3=24568
- spurious scatt. reduction 3=14843
- stack processed without glass backing, props. 3=14842
- stars, containing hypernuclei, prod. by 9 BeV protons 3=24848
- study of elementary proton-nucleon processes 3=7848
- track measurement, digital 3=19328
- track profile meas., micro-densitometer 3=534
- very finely grained, preparation 3=24574
- U salts introd. for min. ionization sensitivity 3=24570

Nucleons and antinucleons

- See also Neutrons and antineutrons; Protons and antiprotons.
 - β -decay of "bare" nucleon, appl. of ξ -limiting process 3=553
 - charge and mag. form factors, expressions for 3=7840
 - charge distrib., rel. to Coulomb energy of He³ 3=613
 - charge radius calc. with modified propagator 3=17261
 - electric structure 3=4381
 - electromagnetic form factors, rel. to $\pi-\pi$ interacts. 3=5920
 - electromag. struct. 3=4418
 - e.m. form factor, rel. to 2π and 3π resonances 3=22115
 - e.m. structure, isoscalar, three-pion state contrib. 3=14968
 - e.m. structure, contrib. of three-pion state 3=2255
 - e.m. structure, 2π contribution calc. 3=2253
 - form factor, p-meson effects 3=14970
 - form factors and resonance particles 3=10103
 - form factors, useful expt. suggestion 3=19671
 - isoscalar e.m. structure, multi-pion resonances 3=24710
 - isobaric model, for K⁻-p interact. 3=7923
 - isovector form factors 3=17259
 - magnetic moments 3=10104
 - mass difference, n-p 3=6009
 - meson field, radiation damping theory 3=7806
 - model, rel. to jet investigations 3=17364
 - motion in deformed light nuclei 3=10203
 - N + K*, rel. to hyperon 1815 MeV resonance 3=4420
 - nuclear matter, stability conditions of fermion systems 3=18750
 - nuclear reactions with exchange of surface nucleons 3=8057
 - nucleon-antinucleon pairs, diffractive production 3=15169
 - nucleon-nucleon potential and K-meson exchange 3=14974
 - polarizability, rel. to γ -ray scattering 3=15170
 - as Regge pole, and $J = \frac{1}{2} T = \frac{1}{2} \pi N$ phase shift 3=14969
 - resonant states, phenomenological theories 3=14872
 - 20-180 MeV, semi-classical approx. and optical model exact solution 3=12658
- interactions**
- collisions, $> 3 \times 10^{10}$ eV, characteristics 3=22116
 - cosmic ray, high-energy interactions, character 3=12538
 - emulsion nuclei at $> 10^{12}$ eV, analysis 3=4382
 - heavy nuclei-nucleon reaction; hydrodynamic theory 3=2439
 - high-energy, by diagram method and dispersion relations 3=12540
 - jets, double max. ang. distrib., in photographic plates, due to cosmic rays 3=5993
 - with Λ -hyperons, hard core 3=10179
 - with mesons, pseudoscalar 3=5930

Nucleons and antinucleons — contd**interactions — contd**

- meson field, Green functions 3=24605
 in nuclear matter, eff. of veloc.depend. forces 3=6132
 with nuclei, forward and backward peakings 3=12659
 nucleon and (3,3) resonance, "bootstrap" relationship 3=7841
 with nucleus, at 10^{11} eV, peripheral collisions 3=4385
 photon-nucleon vertex parts, integral representation 3=14889
 potential bet. two nucleons, using Low eqn. 3=15069
 with p, in emulsion, 9 BeV 3=17271
 with protons, 25 GeV, in emulsion 3=7848
 with protons, strange particle prod. calc. 3=7927
 resonances, rel. to hyperons, global symmetry 3=4420
 secondary particle ang. distrib., for 10^{10} - 10^{13} eV reactions 3=17273
 , single burst spectra in cosmic rays 3=19595
 with spurions, symmetry requirements 3=12510
 two-body problem, exactly soluble, with non-central forces 3=24664
 two-nucleon, review 3=14973
 two-nucleon system, K^- capture, Y^* prod. 3=10170
 virtual particles, interaction cross-sects. 3=2256
 γ -N, pion prod., π - π interact. effects 3=15016
 $\gamma + N \rightarrow Y + K$, resonance model 3=24797
 \bar{K} -mesons, S-wave, with vector mesons 3=10172
 \bar{K} -N, S-wave, as two-channel problem 3=15029
 K and \bar{K} -mesons, ρ and ω exchange 3=4458
 N-hyperon bound systems 3=17340
 $N + \gamma \rightarrow N + \pi + \pi$ and $N + \pi \rightarrow N + \pi + \pi$, near threshold, theory 3=6032
 2N- K^- mechanism 3=24788
 N- π , high energy, rel. to "target mass" in one-meson-exchange 3=12539
 N- π , hyperon ang. distrib., rel. to parity 3=4462
 N- π , inelastic, at high energy 3=6040
 N- π , rel. to jets, 10^{11} - 10^{15} eV and N-N interact. 3=17364
 N- π resonances, review 3=4430
 N- π , strange-particle prod. 3=19700
 N- \bar{N} bound state in ladder-chain approx. 3=7813
 N-N in cosmic ray jets, model 3=4542
 N-N forces, ground state props. of nuclei 3=2357
 N-N, low-energy, rel. to nucleon core 3=4383
 N-N, $1-10^3$ GeV, intensities of produced particles 3=4366
 N-N, 100 GeV 3=10105
 $N + N \rightarrow \pi + N + N$, "bipion" diag. contrib. 3=5994
 N-N potential, two-pion exchange, calc. 3=12450
 N-N, renormalized coupling const. 3=2254
 N-N, in shell-model analysis 3=2373
 N-N, s-wave, charge symmetry 3=12519
 \bar{N} -N system, chirality invariance 3=7897
 N-N, velocity depend., in nucleus 3=17382
 N-N, rel. to low-energy nuclear potentials 3=2348
 N-N, 200 GeV, multiple meson prod. 3=24711
 N-N and N-nucleus, cosmic rays in emulsions 3=24817
 N-p, 26.7 GeV/c, effective target mass 3=19627
 > 100 GeV, in cosmic-ray showers 3=19618
 N-p, at 9 BeV, in nuclear emulsions, rel. to multiplicity 3=6002
 π -N, 7.5 GeV, pole diagram analysis 3=24773
 π -N $\rightarrow \pi\pi$ N at 290 MeV 3=4439
 π -N and p-N, up to 10 BeV, review 3=22120
 π -nucleon coupling consts 3=19551
 π -N, resonance spectrum, Regge trajectories, dynamical basis 3=22170
 π -N, resonance structure, dynamical mechanism 3=22169
 $\pi^- + N \rightarrow Y_2^* + K$, Y_2^* search 3=17349
 $\pi^- + N \rightarrow K^0(\bar{K}^0) + Y(K,N) + m\pi$, 2.8 BeV/c, resonances 3=17315
 π photoproduction, from dispersion relns. 3=22162
scattering
 calc. with full recoil 3=12452
 with deuterons, elastic, theory 3=10108
 d-N, phase shift ambiguity 3=24736
 DWBA validity range 3=19829
 elastic, high-energy, large-angle cross-section decrease 3=6057
 electrons, high-energy, use of Regge poles theory 3=5987

Nucleons and antinucleons — contd**scattering — contd**

- K-mesons, high-energy, possible interpretations 3=2267
 by K mesons, ρ and ω reson. exchange contrib. 3=15034
 K^- -N, elastic, Tamm-Dancoff approx. calc. 3=24795
 Λ -hyperons, rel. to π -N coupling constants 3=4468
 Λ -N, two pion-exchange contrib. calc. 3=17344
 on light nuclei, spin-dependent quasi-elastic 3=10336
 by Li^6 first excited state, impulse approx. 3=15183
 meson-nucleon, large-angle, Regge poles and asymptotic behaviour 3=14994
 N-p, Dirac monopoles prodn. cross-section 3=14861
 neutrino-N, Regge pole effects 3=22104
 neutrino-nucleon, π production 3=15008
 neutrinos, search at 1 GeV 3=578
 by nuclear density fluctuations inside nucleus 3=6121
 nuclear, high-energy, total cross-sections 3=10334
 on nuclei, at high energies, angular correl. 3=4629
 by nuclei, high energy, impulse approx. 3=15184
 nucleon-nucleus, complex effective mass, calc., 100-300 MeV 3=6231
 nucleon-nucleus spin-orbit interaction potential, 40-660 MeV 3=17265
 N- π , empirical systematics 3=22184
 N- π , exchange, threshold singularities 3=2316
 N- π , phase-shifts, inner Coulomb corrections 3=15021
 N- π , s- and p-wave detm. 3=4419
 N- π , square diagram analyticity 3=17185
 N- π , strip approx. and peripheral method 3=2295
 N- Θ scatt. dispersion rel., Lee model with dipole ghost 3=10038
 N- H^3 , and H^4 state 3=19714
 N-K 3=4460
 N-N, hard core, transition operator 3=22118
 N-N, phase shifts 3=17263
 N-N scatt. amplitudes, multiperipheral model 3=19556
 by nucleus, and distorted-wave impulse approx. 3=10337
 in nucleus, on nuc. matter density fluctuations, using optical potential 3=8083
 by nucleus, one-pion exchange approx. 3=622
 by nucleus, optical model analysis 3=621
 π -mesons, effect of π - π interaction 3=599
 π -mesons, effect of π - π interact. 3=7905
 π -mesons, up to 25 GeV, statist. model 3=7794
 π -mesons, s-wave, dispersion relns. 3=7900
 π -mesons, high-energy, real part 3=5961
 π -mesons, spin rotation coeffs. meas. 3=6048
 π -nucleon, Regge poles and J parity 3=7910
 π -N, backwards, effect of nucleon Regge pole 3=19681
 π -N, effect of π - π interaction 3=15017
 π -N, in octet model 3=19687
 π -N, low-energy, $P_{11}^{(1)}$ and S waves 3=24778
 π -N, S-waves, boundary-condition model 3=19685
 π -N, consequences of analyticity and unitarity 3=10119
 π -N, counter coincidence system, multichannel 3=16895
 π -N, effects of bipion resonances ζ and ρ 3=10160
 π -N, forward amplitude, asympt. props. 3=10037
 π -N, $I = \frac{1}{2}$, $J = \frac{1}{2}$ state 3=2314
 π -N, non-charge exchange, two vacuum poles 3=12492
 π N phase shift ($J = \frac{1}{2}$ $T = \frac{1}{2}$) and nucleon as Regge pole 3=14969
 π -N resonance, $J = \frac{3}{2}$, $I = \frac{3}{2}$, theory 3=12491
 π -N, second and third resonances rel. to cpd. states 3=22182
 π -N, soft-pion prod. and chirality conserv. 3=22181
 π -N, theory, and $Y^*(\pi\Lambda)$ reson. 3=17343
 π -N, total number of zeros 3=14895
 π -N, with 2.8 BeV/C pions 3=4443
 π -N, up to 500 MeV, Chew-Low theory 3=24776
 polarization, in optical model framework 3=17267
 20-180 MeV, semi-classical approx. and optical model exact solution 3=12658
scattering, nucleon-nucleon
 amplitude form 3=4419
 asymptotic behaviour, Regge pole analysis 3=24713
 chain-of-pions range for very high energy 3=22117
 consequences of analyticity and unitarity 3=10119
 coupling const. and spectral functions, by conformal mapping 3=22081
 diffraction effects calc. using S-matrix unitarity 3=4384

Nucleons and antinucleons — contd

scattering, nucleon-nucleon — contd

- dispersion reln. study rel. to angle 3=10116
- elastic, cross-sects., above 10 GeV, rel. to Pomeranchuk prediction 3=4361
- final-state interact. 3=19619
- final state interact. corrections 3=12451
- Fredholm formalism, unified and complete 3=14975
- high-energy, analyticity in ang. momentum 3=14976
- high-energy, range, single-channel model 3=19620
- high-energy, rel. to Regge poles and isospin indep. 3=2267
- inelastic, 10^{12} eV, mean free path in C 3=24715
- inelastic, with only one or neither "excited" 3=14972
- rel. to jets, 10^{11} – 10^{15} eV and π -N interact. 3=17364
- Mandelstam represent., strip approx. 3=7842
- meson production at high energy, "two-centre" model 3=6019
- and mesons, vector, exchange, 170 MeV 3=17264
- momentum space, one-pion-exchange phase shifts 3=22119
- non-local, singlet even parity 3=19557
- ω NN coupling const., impulse approx. 3=5948
- 142 MeV, phase shifts analysis 3=12454
- one-pion exchange model at 8.3 GeV 3=10106
- partial-wave dispersion relns., and ρ and ω contribs. 3=10109
- partial waves ($l \geq 2$), numerical results 3=12453
- phase-shift analysis at 40–310 MeV 3=14977
- phase shifts, spin-orbit interact. 3=581
- π -meson and nucleon prod. at 9 BeV 3=4439
- π prodn., single 3=10146
- π , slow, production 3=17309
- pion-nucleon resonances, Regge pole theory 3=5952
- polarization by spin-orbit forces 3=10107
- polarization, effect of Regge poles 3=5995
- primary energy determination, ultra-relativistic, tests 3=17262
- Regge poles, pole-residues and trajectories 3=7843
- Regge poles, in scattering amplitudes 3=24714
- scattering amplitudes, vacuum Regge poles 3=24654
- 660 MeV, amplitudes, by superposition model 3=17265
- statistical model, up to 25 GeV 3=7794
- strip approx. at high energies 3=24712
- 10^2 – 10^6 GeV, in cosmic-ray showers 3=6100
- theory, review of selected aspects 3=5996
- 300 BeV, diagram method calc., rel. to experiment 3=12541
- two-meson approximation, with π - π interaction 3=17266

antinucleons

- annihilation, heavy meson prod., residual interact. 3=6081
- annihilation, perturbation theory 3=7844
- annihilation producing two mesons, unitary symmetry 3=582
- annihilation, resonance model at rest 3=17268
- annihilation, strange-particle prod. 3=19700
- annihilation, theory 3=4386

Nucleus

See also Elements, origin; Hypernuclei; Radioactivity; Scattering, particles.

- " α -particle" clusters, data from ($\alpha, 2\alpha$) meas. 3=17385
- binding energy, from Sr to Ru 3=4728
- d-s shell, structure of low-lying states 3=6128
- deformed nuclei, dipole resonance shape 3=15093
- density distrib. in extreme surface region 3=6369
- effective charge, electron scatt. study 3=7971
- $84 \leq A \leq 104$ and $111 \leq A \leq 125$, masses, binding energies 3=10220
- (γ , np) reactions, rel. to nucleon-nucleon correlations, light nuclei 3=19834
- light nuclei, charge density calc. 3=19754
- masses, review and tabulation 3=10221
- moments of inertia, K = 0 rot. bands of odd nuclei 3=10243
- moments of inertia rel. to superfluid phase collective excitations 3=10222
- nuclear pair correl. function and momentum distrib. meas. 3=7964
- odd-A nuclei ($151 \leq A \leq 191$), moments of inertia 3=2380
- optical anisotropy investigation method 3=15087
- optical potential 3=4611
- polarizability, rel. to γ -ray scattering 3=15170
- polarization by rotation of paramag. crystal 3=14432
- polarization, dynamic, Lorentz field meas. method 3=2365

Nucleus — contd

- Ac^{224–6}, prod. by Ne²² irradi. of Th²³² 3=24983
 - Al²⁷–Mg²⁴ mass difference 3=24836
 - Al²⁷–Mg²⁴ mass difference, precision detm. 3=10219
 - Ar³⁵, mass 3=8131
 - Ba, charge radius, mesic atom data 3=8218
 - Ba^{131m}, new isomer 3=8000
 - Be⁸, detection in ground state 3=22269
 - Be⁸, prod. due to interaction of Be⁹ with Ag and Br 3=24981
 - C¹², neutron kinetic energy in, from C¹²(p, pn) 3=670
 - C¹², nucleon momentum distrib. 3=624
 - Cd, polarization effects, isotope studies 3=25049
 - H⁵, search 3=2330
 - He³, Coulomb energy calc., symmetry importance 3=17358
 - He³, Coulomb energy, charge distrib. of nucleon 3=613
 - He³, form factors, by electron scatt. 3=17357
 - He³, scatt. by α -particles, resonating-group structure 3=24811
 - He³–C¹² scatt. at 28.5 MeV 3=8129
 - He³–S³² elastic scatt. at 28.5 MeV 3=8129
 - He⁸, binding energy 3=7939
 - He⁸, observation from T-shaped hammer tracks of 9 BeV proton react. in emulsion 3=4475
 - In¹¹⁵, production and identification 3=4593
 - La^{140–142}, identification 3=8040
 - Li⁸, polarization, Li⁷(d, p) study 3=24964
 - Mn⁵⁴, polarization in Fe 3=17636
 - Sb, neutron separation energies of isotopes 3=714
 - Sn, neutron separation energies of isotopes 3=714
 - Sn¹¹⁹, in organic Sn cpds., quadrupole interaction and isomeric shifts 3=15415
 - Te^{124, 6, 8, 130}, double neutron separation energies 3=22336
 - Th²²⁷, prod. by Ne²² irradi. of Th²³² 3=24983
 - U²³⁸, nuclear temp. 3=8104
 - Zr⁹⁰–Sr⁸⁸ mass difference 3=8074
- electric moment**
- See also Molecules, nuclear coupling.
- atomic shielding factors, theory, review 3=8173
 - even-even medium-mass, octupole deform. 3=24859
 - open shell antishielding of hyperfine interact. 3=25038
 - quadrupole, calculation from h.f.s., intermediate coupling 3=2362
 - quadrupole, antiscreening consts. calc. 3=19923
 - quadrupole moment, vacuum polarization induced 3=22515
 - quadrupole, odd-A nuclei, positive-neg. asymm. 3=15077
 - quadrupole perturbations in angular correlations 3=12563
 - quadrupole precession, classical discussion 3=12561
 - transuranic, unstable, quadrupole, calc. 3=19752
 - Ba, quadrupole, and isotope shifts 3=12562
 - Be⁹, quadrupole, calc. 3=2437
 - C¹², quadrupole, calc. 3=2437
 - Co⁵⁹ 3=6221
 - Dy^{156, 158}, internal quadrupole 3=15282
 - Dy¹⁶⁰, quadrupole 3=19790
 - Eu¹⁵⁴, quadrupole 3=3173
 - Fe⁵⁷, excited state, quadrupole 3=25038
 - Fe⁵⁷, quadrupole, of first excited state 3=2567
 - Fe⁵⁷, quadrupole, 14.4 keV 3=6142
 - Fe^{57m}, quadrupole 3=12772
 - Hg^{194, 196, 198m}, quadrupole 3=17529
 - Ho¹⁶⁵, quadrupole 3=2362
 - Ho¹⁶⁵, quadrupole 3=13029
 - I¹²⁹, 26.8 keV, from Mössbauer effect in KIO₃, NH₄IO₃ 3=19786
 - Li⁷, quadrupole 3=25099
 - Li⁷, quadrupole, rel. to (1p)³ config. 3=24840
 - Mn⁵⁵ 3=12564
 - Nd^{143, 145}, quadrupole, by atomic beam magnetic resonance 3=4709
 - Ne²⁰ 3=6165
 - Pm^{143, 145, 147} 3=12906
 - Pr¹⁴¹, quadrupole 3=2362
 - Sc⁴⁵, quadrupole 3=2361
 - Sr⁸⁷, quadrupole, from h.f. s. of Sr I 3=24842
 - Ta¹⁸¹, quadrupole, in Hf crystals, by γ - γ correl., 0–48 MeV level 3=6454
 - Ta¹⁸¹, quadrupole 3=10329

Nucleus — contd

electric moment — contd

- Te¹²⁵, 35 keV level, quadrupole, from γ -ray splitting 3=19785
 Tm¹⁶⁹, 8.42 keV state, quadrupole 3=8006
 Tm¹⁶⁹, 8.42 keV level, quadrupole 3=24841
 V⁵¹ 3=6221
 V⁵¹, and three-particle model 3=19778
 Y⁹¹, quadrupole 3=2361
 Yb¹⁷³, quadrupole 3=2364

energy levels

See also Radioactivity, decay schemes.

- A=6, from free nucleon—nucleon interaction, calc. 3=12579
 A = 152-197, γ -energies, precision det. 3=8004
 actinide isotopes, collective γ -vibs. 3=17396
 angular correlations, α - γ , measurement 3=24882
 "centre of gravity" theorem in second order 3=2376
 collective excitation, spherical even nuclei, anharmonic corrections 3=6155
 collective, vibrational, spheroidal even nuclei 3=17396
 compound-nucleus, statistical fluctuations 3=24855
 deep hole excitation states, shell single-particle model 3=17449
 deformed even—even, corrections and transition probabilities 3=15094
 deformed even nuclei, perturb. corrections to collective states energies 3=6154
 deformed nuclei, spectral line isotopic shift 3=6159
 densities, rel. to nuclear well diffuseness 3=24834
 dipole excitations on superfluid model 3=6157
 doublet splittings, shell-model calc. 3=22258
 EO transitions, collective, rel. to nuc. shape 3=24843
 E2-M1 mixing ratios $2^{+} \rightarrow 2^{+}$ transitions, even nuclei 3=15096
 E2 transitions in β - and γ - vibrational bands of even—even nuclei 3=15097
 E2 transitions in deformed even nuclei bet. β and γ -vib. states 3=2375
 in 82-neutron region, stripping study 3=2390
 electromagnetic transitions, deformed odd—odd nuclei 3=6150,
 electromagnetic transitions of multipole order
 $L = |J_i - J_f| + 1$ 3=7983
 energy surface spacing 3=4562
 even-mass nuclei, $82 < N < 92$, up to 2 MeV 3=24853
 even—even, Ne²⁰-S³², spins, from γ ang. correl. on p scatt. 3=24852
 even—even, nonspherical, Bogolyubov method, accuracy 3=2377
 even—even nuclei, 5⁻ levels 3=22283
 even—even nuclei, theory, review 3=10204
 even—even, second 2⁺ levels 3=6160
 even—even spherical nuclei, anomalous vibrational spectra 3=2370
 even nuclei, deformed, vib. E1, E2, E3 transitions 3=10241
 even nuclei, double Coulomb excitation 3=12577
 even nuclei, mag. dipole transitions 3=7981
 even nuclei, $150 < A < 190$, first excited 2⁺ states, half-lives 3=8003
 even and odd systems, level spectra, on "superfluid nuclear model" 3=10207
 f_h nuclei, configuration interact. 3=15092
 first excited states, delayed coincidence lifetime meas., analysis 3=2384
 g-factors, meas. by reactions due to H₂⁺ and He⁺ beams 3=24837
 heavy nuclei, effect of isobaric spin purity on nuclear potentials 3=10223
 heavy nuclei, surfaces, intersection, rel. to α -transition 3=10235
 Hofstadter potential distrib. 3=24851
 hyperfine structure, μ -mesic atoms 3=10208
 individual-particle states 3=10240
 isobaric nuclei, analogue states 3=17395
 isobaric states correspond., heavier nuclei 3=633
 isomers, sepn. and enrichment 3=2369
 jⁿ config., pairing, quadrupole interact. 3=620
 level density, interacting Fermi system 3=15091
 level density rel. to neutron no. near closed neutron shell 3=19779
 level densities, models with pairing correls. 3=12550

Nucleus — contd

energy levels — contd

- light mirror nuclei, lower excited levels 3=22284
 light nuclei, excitation, "packing" near threshold 3=22289
 light nuclei, ghosts near thresholds 3=660
 light nuclei, levels involving (d_{5/2})₂ state 3=4566
 light nuclei, mag. dipole transitions 3=10332
 low-lying and virtual, study with reactions 3=24915
 M1 transitions, l-forbidden, E2/M1 mixing ratio 3=10239
 mass-13 nuclei, search for $\frac{1}{2}^{-}$ level 3=8132
 μ -mesic atoms, collective levels 3=6372
 multiple E2 Coulomb excit. of rot. states, cross-sections 3=4559
 N=82 to 90, collective levels and deformations 3=8019
 "negative levels" existence establishing method 3=12571
 neutron, hole states, from (p, d) or (d, t) reactions 3=19762
 neutron, single particle, from (d, p) reactions 3=19762
 neutron states, single-particle, energies obs. 3=10247
 neutron width distrib. 3=22282
 nonaxial nuclei, by rigid rotator model 3=10206
 non-spherical, excited, vibrational levels 3=10238
 nonspherical nuclei, collective levels, microscopic description 3=2379
 non-spherical nuclei, negative parity low-lying levels 3=6158
 nonspherical nuclei, vibrational levels 3=24854
 nuclear spectroscopy conference, Kiev (1963) 3=15090
 nuclear spectroscopy conference, Leningrad, Jan.-Feb. 1962 3=7977
 nuclear symmetry rel. to fission 3=6305
 octupole deform. in even—even medium-mass nuclei 3=24859
 odd-A nuclei ($151 \leq A \leq 191$) 3=2380
 odd-mass, deformed nuc., pairing correls., blocking 3=632
 odd nuclei, odd—even shift in K = 0 rot. bands 3=10243
 odd—odd deformed, with K = 0, distinctive features 3=10236
 1⁻ state in vibrational region 3=10248
 projection theorem, particle—hole system 3=12575
 quadrupole vibrations, spherical nuclei 3=4563
 rare-earth, deformed, E1 transitions 3=6152
 rare-earth nuclei, deformed, individual part. motion 3=6156
 rare earth isotopes, collective γ -vibs. 3=17396
 rare-earths, rotation- γ -vibration interaction 3=2381
 rectangular well, nonspherical, inf. deep, single-particle levels 3=6138
 reduced widths, from stripping reactions 3=19765
 rotational, of axi-symmetrically deformed even nuclei 3=10244
 rotational, of odd nuclei 3=4560
 rotational states, intrinsic symmetries 3=2374
 shells, rel. to instantaneous neutron fission 3=6308
 short-lived, g-factor meas. 3=634
 spacing distrib. 3=9362
 spacing distrib., next-nearest neighbour energy levels 3=7978
 spherical even—even, higher excited states, branching ratios rel. to pairing and quadrupole forces 3=2371
 spherical even nuclei, vib. character of low-lying levels 3=22286
 spherical nuclei, quadrupole oscills. 3=6161
 spherical nuclei, vib. states, low-energy 3=2372
 spin-orbit state splitting, spherical nuclei 3=15095
 spin-wave excitation, giant resonance 3=2378
 splittings, combined mag. dipole, elec. quadrupole interact. 3=10234
 states with constant neutron excess, relationships betw. 3=10242
 statistical distrib., theory 3=9
 strongly deformed, ground and excited state props., superfluid model 3=7982
 strongly deformed nuclei 3=4561
 two-quantum transitions 3=24850
 "vibrational region", s-wave strength function 3=19761
 widths calc. for proton scatt., Woods—Saxon pot. 3=22281
 Ac²²⁷ 3=2420
 Ag¹⁰⁸ 3=15215

Nucleus — contd

energy levels — contd

- Al, 1.013 and 1.91 MeV levels 3=6254
 Al²⁵ 3=6234
 Al²⁵ 3=22372
 Al²⁵, lifetime of first excited state 3=12585
 Al²⁵, 3.76 MeV, spin, by Mg²⁴(p, γ)Al²⁵ at 1.49 MeV reson. 3=19772
 Al²⁶, low-lying states 3=19773
 Al²⁷ 3=6199
 Al²⁷, from Mg²⁶ + p 3=24933
 Al²⁷, 2.21 MeV 3=4567
 Al²⁷, 2.21 MeV, γ-ray widths 3=22297
 Al²⁷, 2.98 MeV, width and branching ratio 3=22298
 Ar^{38,40}, from projection theorem 3=12575
 Ar³⁸ 3=10256
 Ar³⁹ 3=8115
 Ar⁴⁰, p-bombarded at 5.6 MeV, γ-γ, γ-p ang. correls. 3=6250
 Ar⁴¹, shell model analysis 3=7990
 As⁷³ 3=19781
 As⁷⁵ 3=6297
 As⁷⁷ 3=7996
 Au, proton bombarded, nuclear temp. 3=12669
 Au¹⁹², excited levels 3=22350
 Au^{193,195,197}, first excited states, transition probabilities 3=8017
 Au¹⁹⁸, low-level, from Pt¹⁹⁹ decay 3=17422
 B⁹ intermediate, in C¹²(p,p'3α) react. 3=2458
 B¹⁰ 3=667
 B¹⁰, first excited state, lifetime 3=2383
 B¹⁰, 2 MeV level, confirmation and nature 3=2488
 B¹⁰, 5.11 and 5.16 MeV levels 3=24860
 B¹¹, in unified model 3=2382
 B¹² 3=4664
 Ba¹³⁴ 3=24903
 Ba¹³⁴, excited states and spins 3=15114
 Ba¹³⁶ 3=4572
 Ba¹³⁶, and isotronic nuclei, stripping study 3=2390
 Be^{8,9} 3=10383
 Be⁸ 3=19882
 Be⁹ 3=22325
 Be⁸, α interactions, effect on C¹²(p,p'3α), p energy distrib. 3=10345
 Be⁸, first excited, rel. to giant dipole res. 3=17464
 Be⁸ ground state, width 3=6094
 Be⁸ intermediate, in C¹²(p,p'3α) react. 3=2458
 Be⁸, 2.94 MeV state 3=19874
 Be⁸, 4 MeV, non-existence, from C¹²(γ,α)Be⁸ 3=17450
 Be⁸, 18.9 MeV 3=17480
 Be⁸, 20 MeV, p-α branching ratio meas. 3=10250
 Be⁸, 25.3 MeV 3=878
 Be⁸, excited by electron scatt. 3=12580
 Be⁸, first excited state 3=22291
 Be¹⁰, two-parameter analysis of spectra 3=19767
 Be¹¹⁻¹³, two-parameter analysis of spectra 3=19767
 Bi²¹⁰, from Bi²⁰⁹(d,p) 3=681
 Bi²¹⁰, low levels, tensor forces calc. 3=24874
 Bi²¹⁰, shell-model residual force calc. 3=24875
 Bi²¹⁰, stripping reaction data, shell-model analysis 3=24876
 Bi²¹¹ 3=10315
 Br⁸¹ 3=2406
 Br⁸² 3=6192
 C, from n scatt., 14 MeV, n,γ coincidences 3=17476
 C^{10,11} 3=12671
 C¹¹, 6.48 MeV level 3=15100
 C¹² 3=2447
 C¹² and Be⁸ intermediate nuclei in C¹²(α, 4α) reaction 3=4671
 C¹², collective states and ground-state correl. 3=17398
 C¹², excited states 3=15192
 C¹², first excited, rel. to giant dipole res. 3=17464
 C¹² intermediate, in C¹²(p,p'3α) reaction 3=2458
 C¹², levels between 15 and 20 MeV 3=19850
 C¹², 9.63 MeV γ-ray width, and prod. in stars 3=11568
 C¹², 7.656 MeV, O⁺ level 3=10242
 C¹², 12.71 and 15.11 MeV 3=19838
 C¹³ 3.09 MeV level width 3=24954
 C¹⁴, 1st excited state from C¹³(d,p)C¹⁴ 3=24969
 Ca, from n scatt., 14 MeV, n,γ coincidences 3=17476

Nucleus — contd

energy levels — contd

- Ca⁴⁰ 3=6237
 Ca⁴⁰, first excited levels 3=22300
 Ca⁴⁰, (p,p'γ) 150 MeV scatt. study 3=10342
 Ca⁴⁰, spin-wave excitation, giant resonance 3=2378
 Ca⁴⁰, 2, 3, 4th excited states, spin, from K³⁸(p,γ)Ca⁴⁰ γ,γ correl. 3=19776
 Ca⁴² 3=10257
 Ca⁴², from Sc⁴² β decay, anomaly 3=22301
 Ca⁴⁴, spins and parities 3=12623
 Cd¹⁰⁷ 3=19819
 Cd¹⁰⁸, from In¹⁰⁸ decay 3=15150
 Cd^{108,110,114}, quadrupole spherical vibration 3=4563
 Cd¹¹² 3=24867
 Cd¹¹², spin and parity, from Cd¹¹¹(d,p)Cd¹¹², p ang. distrib. 3=12592
 Cd¹¹⁴, from Cd¹¹³(n,γ), capture γ, internal conversion β spectra 3=24959
 Ce, O⁺—O⁺ transition 3=17415
 Ce¹⁴⁰, g-factor of 2.083 MeV 4⁺ state 3=15115
 Ce¹⁴⁰, from La 140 decay γ coincidences, spectra 3=22307
 Ce¹⁴⁰, spins and parities, γ-γ ang. correls. 3=24868
 Ce¹⁴⁰, 2.083 MeV 4⁺ state, g-factor 3=4574
 Ce¹⁴⁰, 2.083 MeV state, g-factor 3=8002
 Ce¹⁴⁰, 2.083 MeV two-proton level 3=12560
 Ce¹⁴¹, and isotomic nuclei, stripping study 3=2390
 Cl³⁵ 3=19775
 Cl³⁵, from ³⁴(p,γ)Cl³⁵, γ's, 800-1400 keV p's 3=17469
 Cl³⁵, 7.55 MeV, from γ-ray spectra from proton capture by S³⁴ at 1214 keV 3=8087
 Cl^{35,36}, average level spacings, strength function 3=19860
 Co^{55,57} 3=24934
 Co⁵⁵, from Fe⁵⁴(p,γ), E_D = 770-1100 keV 3=17472
 Co⁵⁸ 3=15143
 Co⁵⁷ 3=2386
 Co⁶⁰, isomeric transitions, γ-ray energies 3=6153
 Cr⁵²⁻⁵³, from Cr(n,n'γ) 3=2466
 Cr⁵⁴ 3=19866
 Cs¹³²—Xe¹³² ground states, energy diff. 3=10295
 Cs¹³³, spin, from Ba¹³³ decay, by e capture 3=19820
 Cs¹³⁴, first four even parity levels 3=12600
 Cu⁶³, first four excited states 3=10338
 Cu⁶³, low-lying, comparison with 3 models 3=15107
 Cu⁶³, 961 keV 3=14938
 Cu⁶⁴, from γ rays from Ni⁶⁴(p,n_γ)Cu⁶⁴ 3=12589
 Cu⁶⁵, model for low-lying levels 3=19780
 Dy¹⁵⁵ ground state 3=19823
 Dy^{156,158}, first rotational level 3=17458
 Dy¹⁵⁸ 3=10307
 Dy¹⁵⁸ 3=10308
 Dy¹⁵⁹ 3=4597
 Dy¹⁶⁰, from Tb¹⁶⁰ β-decay 3=19790
 Dy¹⁶⁰, from Ho¹⁶⁰ decay, conversion electron coincidences 3=15154
 Dy¹⁶⁰, odd-parity states 3=12599
 Dy¹⁶⁰, 86.5, 283, 966 keV, lifetimes 3=15121
 Dy^{160,162}, 2⁺ and 4⁺ states, lifetimes 3=10267
 Dy¹⁶¹, hyperfine splitting, temp. depend. 3=4999
 Dy¹⁶², 4⁺ level energy 3=8134
 Dy¹⁶⁵, isomeric transitions, γ-ray energies 3=6153
 Er¹⁶², first rotational level 3=17458
 Er^{164,166,168,170}, rotational 4⁺ levels, excitation 3=15098
 Er¹⁶⁵, from Tm¹⁶⁵ decay 3=10309
 Er¹⁶⁸ 3=10269
 Er¹⁶⁸, excited states 3=6153
 Er¹⁶⁸, from Tm¹⁶⁸ → Er¹⁶⁸ decay 3=8049
 Er^{168,168}, 2⁺ and 4⁺ states, lifetimes 3=10267
 Er¹⁶⁷, nature of 531.8 keV level 3=4578
 Er¹⁶⁸, low-lying, deuteron stripping data 3=10270
 Er¹⁶⁸, 2⁺ rotation level, gR factor 3=2391
 Er¹⁷⁰, 4⁺ level energy 3=8134
 Eu¹⁴⁶ 3=12595
 Eu^{146m} 3=6173
 Eu¹⁴⁷, from Gd¹⁴⁷ decay 3=10300
 Eu^{147,149,151} 3=12596
 Eu¹⁴⁸ 3=14117
 Eu¹⁴⁹, from Gd¹⁴⁹ decay 3=10301
 Eu¹⁵¹ 3=24906
 Eu¹⁵¹, 21.7 keV state 3=17631

Nucleus — contd

energy levels — contd

Eu^{153,155}, excited states 3=6153
 F¹⁷ 3=4631
 F¹⁷, first excited state, lifetime 3=2383
 F¹⁷, first excited state quadrupole decay 3=19745
 F¹⁷, lower levels, α -model of nucleus 3=636
 F¹⁷, single-particle levels 3=6163
 F¹⁷ 3.86 MeV 5/2⁻ from O¹⁶(p, γ)F¹⁷, reson. capture and γ ang. distrib. 3=17403
 F¹⁸, levels at 8.50, 9.00 MeV, evidence 3=2385
 F¹⁸, low-lying levels, lifetimes 3=17402
 F¹⁸ 3=6164
 F¹⁸ 3=19843
 F¹⁸, first excited state, lifetime meas. 3=22294
 F¹⁸, 73 resonances 3=12584
 Fe⁵⁵, from Mn⁵⁵(p,n) reactions, at low energy 3=17473
 Fe^{55,58}, shell-model states assignment 3=24833
 Fe⁵⁶, Coulomb excitation, reorientation effects 3=12588
 Fe⁵⁶, 1st excited state, g-factor 3=17407
 Fe⁵⁶, 40 levels below 5.5 MeV 3=19779
 Fe⁵⁷ 3=6297
 Fe⁵⁷, ground and excited, rel. to isomeric displacement in Mossbauer effect 3=7972
 Fe⁵⁷, Mössbauer scatt. 3=2366
 Fe⁵⁸, 150 levels below 8.1 MeV 3=19779
 Fm²⁵⁴ 3=638
 Fr²²¹, 388 and 544 keV 3=17446
 Gd^{151,152} 3=10302
 Gd¹⁵³, conversion-gamma ang. correl. meas. 3=17417
 Gd¹⁵⁴, collective states energies, perturb. corrections 3=6154
 Gd¹⁵⁴, 123 keV, h.f.s. coupling 3=19789
 Gd^{154,156,158,160}, rotational 4⁺ levels, excitation 3=15098
 Gd^{158m} 3=6173
 Gd¹⁶⁰, 4⁺ level energy 3=8134
 Ge nuclides, excited by 36 MeV N¹⁴; ⁴⁺ ions, reduced probability 3=10260
 Ge⁷⁰ 3=12624
 Ge⁷⁰, 0⁺ level, double Coulomb excitation 3=10261
 Ge⁷³ 3=6297
 He⁴, excited state, from D-T reaction 3=2327
 He⁴, existence of 0⁺ state 3=15047
 He⁴, virtual state, study using T(d, pn)T 3=2331
 He⁸, from He⁴ + n, 20-29 MeV 3=15099
 He⁷ hyperfragment, isomeric state 3=630
 Hf¹⁷⁴, first rotational level 3=17458
 Hf¹⁷⁶ 3=15155
 Hf¹⁷⁶, excited states 3=6153
 Hf¹⁷⁷, first excited state, lifetime 3=6178
 Hf¹⁷⁷, γ -transitions to rotational states, Nilsson model 3=6177
 Hf¹⁷⁷, 113 and 321 keV, lifetimes 3=15121
 Hf¹⁷⁸ 3=8011
 Hf¹⁷⁹, orbit flip mag. transitions 3=2392
 Hf¹⁸⁰, 2⁺ and 4⁺ states, lifetimes 3=10287
 Hf¹⁸⁰, 4⁺ level energy 3=8134
 Hg, optical ns_{1/2}, isotopic shift 3=6182
 Hg¹⁸⁶, 412 keV, absolute meas. 3=19795
 Hg¹⁸⁹, from Tl¹⁸⁹ and Au¹⁸⁹ decay 3=658
 Ho¹⁵⁹ 3=4597
 Ho¹⁶¹ 3=10308
 Ho¹⁶⁵ 3=10306
 Ho¹⁶⁵ 3=15120
 Ho¹⁶⁵, from Dy¹⁶⁵ decay 3=655
 Ho¹⁶⁶, E2 and E1 transition probabilities 3=12598
 Ho¹⁶⁶, excited states 3=6153
 Ho¹⁶⁶, deformed, extensive rotational structure 3=10268
 Ho¹⁶⁶, low-lying, and Nilsson scheme for strongly deformed nucleus 3=12600
 I, by proton bombardment, 100 MeV 3=12591
 I¹²⁷, from γ -ray spectra, on neutron scatt., inelastic 2.95 MeV 3=8106
 I¹²⁸ 3=17414
 I¹²⁹, first excited state, half-life 3=19787
 I¹²⁹, first excited state, lifetime 3=2387
 I¹³¹ 3=22334
 In¹¹⁰ 3=7999
 In¹¹⁶ 3=17437
 In¹¹⁶, near 1.4 MeV 3=24899

Nucleus — contd

energy levels — contd

Ir^{187m,189m} 3=24911
 Ir¹⁸⁸ 3=8016
 Ir¹⁹¹, 129 keV level, lifetime meas. 3=2394
 Ir¹⁹¹, 129.6 keV, lifetimes 3=15121
 Ir¹⁹⁴, isomeric transition, 47 sec 3=2393
 K³⁸ 3=10256
 K⁴¹ 3=7991
 La¹³⁹, *l*-forbidden transitions, matrix elements 3=4573
 Li⁵, α -p interaction, effect on C¹²(p, p') 3α 3=10345
 Li⁶, from free nucleon-nucleon interaction, calc. 3=12579
 Li⁶, s-state, single-particle and cluster model wave functions 3=22386
 Li⁶, shell model analysis of T = 1 levels 3=2373
 Li⁷ 3=6229
 Li⁷ 3=10249
 Li⁷, first excited state, mean lifetime 3=4564
 Li⁷, from Li⁷(γ , t)He⁴, $\gamma \leq 9.5$ MeV 3=8070
 Li⁷, from rotational model 3=12549
 Li⁷, 5.5 MeV, J = 5/2, possible, from Li⁷(γ , α)H³, α spectrum 3=17397
 Li⁷, 5.7, 6.8 MeV, spin and parity 3=19766
 Lu¹⁷⁶, γ -transitions to rotational states, Nilsson model 3=6177
 Lu¹⁷⁸, 114 and 396 keV, lifetimes 3=15121
 Lu^{178,177}, first excited state, lifetime 3=6178
 Lu¹⁷⁸, 3.7 hr isomeric state, rotational nature 3=8010
 Mg, by γ -ray scattering, resonant, ≤ 12 MeV 3=6166
 Mg²⁴ 3=12670
 Mg²⁴ 3=17468
 Mg²⁴, rotational, theory 3=17404
 Mg²⁵, lifetime of first excited state 3=12585
 Mg^{25,26}, from Si²⁸, $^{26}(n, \alpha)$ 3=8108
 Mg²⁶, from Al²⁸ decay γ coincidences 3=22295
 Mg²⁶, rotational props. of level structure 3=8125
 Mg²⁶, 1.33 MeV level, no confirmation 3=7987
 Mg²⁶, Coulomb excitation, reorientation effects 3=12588
 Mn⁵⁵ 3=6164
 Mn⁵⁵ 3=6237
 Mn⁵⁵, first 3 excited states, spin 3=22302
 Mo, isotopic shift (X-ray level), finite nuc. size corr. 3=6182
 Mo nuclides, excited by 36 MeV N¹⁴; ⁴⁺ ions, reduced probability 3=10260
 Mo⁹², first level, Coulomb excitation 3=17409
 Mo^{92,94-98,100} 3=24956
 Mo⁹⁶ 3=22305
 N¹³ 3=17465
 N¹³, near 7 MeV excitation, widths 3=22292
 N¹³, shell model predictions rel. to expt. 3=635
 N¹⁴ 3=6162
 N¹⁴, excited states 11-15 MeV 3=17400
 N¹⁴, 6.44, 7.03, 9.17 MeV, shell model 3=8094
 N¹⁴, ~ 7.60 MeV, effect on C¹³(p, γ)N¹⁴, and C¹³/C¹² ratio in stars 3=11566
 N¹⁴, 10.22 MeV level 3=17399
 N¹⁴, from B¹¹(α , p_n)C¹⁴ reaction 3=19770
 N¹⁶ 3=24862
 Na²¹, first excited state 3=2385
 Na^{22,23}, from Ne^{21,22}(p, γ) reaction 3=4634
 Na²³ 3=17467
 Na²³, first excited state 3=15103
 Na²³, first excited state, mean lifetime 3=4564
 Na²⁴, up to 7 MeV 3=19875
 Nb, by proton bombardment, 100 MeV 3=12591
 Nb⁹³, from n scatt., inelastic, calc. and meas. 3=15110
 Nb⁹⁷, excited states 3=17436
 Nd, stripping study 3=2390
 Nd^{140m} 3=6173
 Nd¹⁴⁴, 2.18 MeV level, parity 3=12633
 Nd¹⁵⁰, first rotational level 3=17458
 Ne¹⁹ 3=668
 Ne¹⁹, 1st and 2nd excited levels, spin sequence 3=15102
 Ne²⁰, by α scatt., two new levels 3=2498
 Ne²⁰, first rotational band, model 3=4565
 Ne²⁰, first 10 excited states 3=19849
 Ne²⁰, ground and 2⁺ first excited state 3=19889
 Ne²⁰, 0.65 MeV, 0⁺ level 3=10242
 Ne²⁰, 4.97 MeV, parity 3=10255

Nucleus — contd

energy levels — contd

- Ne²⁰, 7.20 MeV γ -ray width, and prod. in stars 3=11568
 Ne²⁰, 8.71 MeV, O⁺ level 3=10242
 Ne²⁰, 13.332 and 13.440 MeV levels 3=15193
 Ne²² 3=2449
 Ne²² 3=2500
 Ne²² 3=4673
 Ne²² 3=10387
 Ne²², 1277 keV transition, internal conversion 3=8031
 Ni, proton bombarded, nuclear temp. 3=12669
 Ni^{58,60,62} 3=6281
 Ni^{58,60,62}, two and three-phonon 3=15106
 Ni⁵⁸ 3=12667
 Ni⁶¹ 3=6297
 Ni⁶², first four excited states 3=10338
 Ni^{62,63,65}, shell-model states assignation 3=24833
 Ni⁶⁴ 3=10259
 Np²³⁷ 3=2421
 Np²³⁷ 3=15162
 O, from n scatt., 14 MeV, n, γ coincidences 3=17476
 O¹⁵, from N¹⁴(d,n)O¹⁵ 3=2486
 O¹⁵, 8.926 and 8.988 MeV, spin and parity 3=12582
 O¹⁶ 3=2451
 O¹⁶, low excited states in SU3 scheme 3=10253
 O¹⁶, low excited states, level spacings, transitions 3=15104
 O¹⁶, 0⁺, calc. hole—nucleon interaction theory 3=19768
 O¹⁶, 0⁺, calc., hole—nucleon interaction theory 3=19768
 O¹⁶, O⁺ and 2⁺ excited states 3=15105
 O¹⁶, Shell model form factors, rel. to electron scattering 3=24927
 O¹⁶, 6.052 MeV, internal conversion line 3=15140
 O¹⁶, 6.052 MeV, O⁺ level 3=10242
 O¹⁷, excited states, 10.4–13.7 MeV 3=10390
 O¹⁷, first excited state, lifetime 3=2383
 O¹⁷, lower levels, α -model of nucleus 3=636
 O¹⁷, single-particle levels 3=6163
 O^{17–19}, from (d,p) reactions, 15 MeV 3=12583
 O^{17–20}, energy-level spectra 3=15071
 O¹⁸, low-lying levels, lifetimes 3=17402
 O¹⁸, shell model analysis of T = $\frac{1}{2}$ levels 3=2373
 O¹⁸, O²⁰ 3=637
 O¹⁸ 3=10254
 O¹⁸, 1st-excited state 3=24863
 Os¹⁸⁶ 3=10313
 Os^{186,188}, 2⁺, from Re^{186,188} β decay theory 3=22309
 Os^{188,190}, lower excited states 3=17421
 Os^{190m} 3=10273
 P³⁰ 3=2456
 P³⁰ 3=6246
 P³¹ 3=19774
 P³¹, from Si³⁰(p, γ)P³¹ 3=8088
 P³¹, from Si³⁰(p, γ)P³¹, γ -ray spectra at reson. between 1 and 2.7 MeV p energy 3=12586
 P³², average level spacings, strength function 3=19860
 Pa²³³ 3=4605
 Pa²³⁴ 3=15158
 Pa²³⁴, excited-level scheme 3=2395
 Pa²³⁴, excited levels 3=22312
 Pb, isotopic shift (X-ray level), finite nuc. size corr. 3=6182
 Pb²⁰⁴, E4 cross-over transition 3=8018
 Pb²⁰⁴, 1.274 MeV, mag. moment 3=19763
 Pb²⁰⁵, calc. 3=10276
 Pb^{205–199} 3=19797
 Pb²⁰⁸, two-hole two-particle configs. 3=10275
 Pb²⁰⁹ compound nucleus, virtual states 3=19760
 Pd isotopes, odd-A 3=19783
 Pd nuclides, excited by 36 MeV N¹⁴; γ ions, reduced probability 3=10260
 Pd^{104,106}, quadrupole spherical vibrations 3=4563
 Pd¹⁰⁵, γ - γ coincidences and modified decay scheme 3=24897
 Pd¹⁰⁵, 319 keV state 3=6169
 Pd¹⁰⁶ 3=17410
 Pd¹⁰⁹, from n absorpt., 1.5–10 eV 3=19859
 Pd–Sm region, collective octupole states 3=12576
 Pm^{147m} 3=6173
 Pm¹⁴⁸, λ -forbidden transitions, matrix elements 3=4573
 Pm¹⁴⁷, 91 keV, half-life 3=4576
 Pm¹⁴⁸ 3=15116

Nucleus — contd

energy levels — contd

- Po²⁰⁷, hindered E2 ground state transition 3=19798
 Po²¹⁰, shell-model residual force calc. 3=24875
 Po²¹⁰, 1431 and 1478 keV, half-lives 3=6183
 Po²¹², four-nucleon motion correlation 3=640
 Po²¹⁴, rel. to internal rotation 3=24877
 Pr¹⁴¹ 3=17441
 Pr¹⁴¹, 6.12 MeV, radiation parameter 3=24869
 Pr^{142,144}, stripping study 3=2390
 Pr¹⁴⁴, spin, from β - γ correl. 3=22308
 Pt¹⁹², de-excitation, \bar{e} - γ ang. correls. 3=6181
 Pt¹⁹², quadrupole spherical vibration 3=4563
 Pt¹⁹⁸ 3=10274
 Pu^{238,240}, from alpha-decay meas. 3=15129
 Pu²³⁹, excitation functions, allowing for n scattering and fission 3=6184
 Ra²²⁵, spins and parities, from conversion electron spectrum, from Th²²⁹ decay 3=8056
 Re¹⁸⁴ 3=8014
 Re^{185,187}, first excited states, lifetimes 3=19794
 Re^{186,188}, rotational 3=17418
 Re¹⁸⁷, excited, internal conversion spectrum 3=8015
 Re¹⁸⁷, 686 keV, nature and half-life 3=4580
 Re¹⁸⁸, isomeric transitions, γ -ray energies 3=6153
 Rh, proton bombarded, nuclear temp. 3=12669
 Rh¹⁰⁴ 3=4570
 Rh¹⁰⁴, isomeric transitions, γ -ray energies 3=6153
 Rh¹⁰⁴, low-lying excited states 3=6272
 Rh¹⁰⁵, γ - γ cascades, spins 3=7997
 Rh¹¹⁰ 3=24894
 S³², excited by proton scatt. 3=7988
 S³², inelastic E0 transition 3=10331
 S³², from P³¹(p, γ)S³², 640–1150 keV 3=22377
 S³², spins and parities 3=7989
 S³², 0.41 MeV, O⁺ level 3=10242
 S³³, average level spacings, strength function 3=19860
 Sb, by proton bombardment, 100 MeV 3=12591
 Sb¹¹⁹, 1st excited state 3=15151
 Sb¹²¹, excited states 3=10293
 Sb¹²¹ and 70 keV lifetime 3=17413
 Sb¹²², 159 keV 3=10263
 Sc⁴² 3=10257
 Sc⁴³, low, from Ca⁴²(p, γ), 780–1420 keV p's 3=17471
 Sc⁴⁵, low, from Ca⁴⁴(p, γ), 800–1400 keV p's 3=17470
 Sc^{50m} 3=24894
 Se⁷⁶, first excited state 3=10289
 Se⁷⁶, 0.559 MeV level, lifetime 3=10262
 Se⁷⁷, width of J = 0 and J = 1 levels 3=4645
 Si²⁸ 3=10219
 Si²⁸ 3=12668
 Si²⁸ 3=19847
 Si²⁸, 2⁺ 1.77 MeV level, width 3=22299
 Si²⁸, 6.88 MeV doublet 3=19844
 Si²⁸, 11.3–12.8 MeV 3=2499
 Si²⁹, average level spacings, strength function 3=19860
 Si³⁰ 3=2500
 Si³⁰ 3=24971
 Si³⁰, collective vibs., weak-coupling unified model 3=6167
 Si³⁰, 8.149 and 8.571 MeV 3=4667
 Si³¹ 3=4668
 Sm¹⁴⁶, at 749–3464 keV 3=4596
 Sm¹⁴⁷ 3=10298
 Sm¹⁴⁸ 3=14117
 Sm¹⁴⁸ 3=15116
 Sm¹⁴⁸ 3=19821
 Sm¹⁴⁸, from Eu¹⁴⁸ decay γ -rays 3=10265
 Sm¹⁵⁰ 3=10353
 Sm¹⁵⁰, thermal neutron capture 3=15118
 Sm¹⁵¹, 0.0048 MeV level lifetime 3=8042
 Sm¹⁵², vib. E1, E2, E3 transition probabilities 3=10241
 Sm^{152,154}, 4⁺ level energy 3=8134
 Sm¹⁵⁴, rotational 4⁺ levels, excitation 3=15098
 Sn, pairing props., from model, single interaction, finite range 3=17380
 Sn¹¹⁵ 3=8098
 Sn¹¹⁶ 3=2429
 Sn¹¹⁶, production from In¹¹⁵g 3=4568
 Sn¹¹⁶, width of first excited state 3=639

Nucleus — contd

energy levels — contd

Sn^{118} , spin and parity, from $\text{Sn}^{117}(\text{d},\text{p})\text{Sn}^{118}$, p. ang. distrib. 3=12592
 Sn^{119} , 23.8 keV, γ -transition isomer shifts 3=4571
 Sn^{120} , spin and parity, from, $\text{Sn}^{119}(\text{d},\text{p})\text{Sn}^{120}$, p. ang. distrib. 3=12592
 Sr^{86-88} , deuteron inelastic scatt. 3=4662
 Sr^{88} , O^+ excited state, search 3=15108
 Ta , proton bombarded, nuclear temp. 3=12669
 Ta^{176} 3=24872
 Ta^{182} , γ -decay 3=12601
 Ta^{182} , rotational 3=17418
 Tb^{152} , conversion electron spectrum 3=10304
 Tb^{153} , from Dy^{153} decay, conversion electron coincidences 3=17443
 Tb^{155} 3=19823
 Tb^{157} , 4 new levels 3=22342
 Tb^{159} 3=2414
 Tb^{159} 3=15120
 Tb^{159} , E2 and E1 transition probabilities 3=12598
 Tb^{159} , first excited states, lifetimes 3=12597
 Tb^{159} , from Gd^{159} decay, β , γ spectra, γ - γ , β - γ coincidences 3=22340
 Tb^{159} , 364 keV 3=4577
 Tb^{160} , rotational 3=17418
 Te^{124} , 2691 keV level, spin and parity 3=15113
 Te^{125} 3=6145
 Te^{128} 3=19784
 Te^{128} , 35 keV, electric quadrupole moment, from γ -ray splitting 3=19785
 Th^{230} , from alpha-decay meas. 3=15129
 Th^{232} , vib. E1, E2, E3 transition probabilities 3=10241
 Ti^{46} 3=12665
 Ti^{46} , Coulomb excitation, reorientation effects 3=12588
 Ti^{46-51} 3=19877
 Ti^{47} 3=6297
 Ti^{47} , 160 keV, 3=12587
 Ti^{48} , low excited states 3=19812
 Ti^{50} 3=10287
 Ti^{50} 3=12622
 Ti^{50} , lower excited states 3=7992
 Ti^{50} , shell model analysis of T = 1 levels 3=2373
 Ti isotopes, isomeric levels 3=22310
 Tl^{200} 3=6210
 Tl^{203} , Mössbauer effect. Doppler-broadening 3=629
 Tl^{206} from $\text{B}^{210\text{m}}$ α -spectra 3=19824
 Tm^{166} , from Yb^{166} decay γ 's 3=24908
 Tm^{169} 3=15120
 Tm^{180} 3=19791
 Tm^{189} , E2 and E1 transition probabilities 3=12598
 Tm^{189} , from Yb^{189} decay, γ spectra, coincidence, internal conversion 3=22346
 U , isotopic shift (X-ray levels), finite nuc. size corr. 3=6182
 U^{232} 3=4581
 U^{232} , excited by Pa^{232} β -decay 3=12604
 U^{233} , excitation functions, allowing for n scattering and fission 3=6184
 U^{234} , neutron inelastic scatt. rel. to fission 3=2505
 $\text{U}^{234,235}$, from alpha-decay meas. 3=15129
 U^{235} 2=4606
 U^{235} 3=10319
 U^{235} 3=15160
 U^{235} , excitation functions, allowing for n scattering and fission 3=6184
 U^{238} , level density 3=8104
 U^{238} , in uranium oxide, resonance, with neutrons, 4, 77°K 3=6259
 U^{238} , vib. E1, E2, E3 transition probabilities 3=10241
 $\text{V}^{48,50}$, low energy, from γ -rays on p capture in Ti 3=17406
 V^{51} 3=6297
 W^{182} , collective states energies, perturb. corrections 3=6154
 W^{182} , gyromag. ratio of first excited level 3=24873
 W^{182} , spin by γ - γ directional correlation from Ta^{182} decay 3=4599
 $\text{W}^{182,183}$, non-recoil nuc. res. absorp. rel. to velocity 3=6462

Nucleus — contd

energy levels — contd

$\text{W}^{182,184,186}$, rotational 4^+ levels, excitation 3=15098
 W^{183} 3=10225
 W^{184} 3=8014
 W^{184} , 4^+ level energy 3=8134
 W^{184} , low-lying, deuteron stripping data 3=10270
 W^{184} , populated by Re^{184} decay 3=10271
 Xe^{131} , low energy transitions, 541.7 keV level 3=651
 Xe^{132} 3=2409
 $\text{Xe}^{132,134}$, quadrupole spherical vibration 3=4563
 Y , by proton bombardment, 100 MeV 3=12591
 Y^{89} 3=10363
 Y^{89} , deuteron inelastic scatt. 3=4662
 Y^{89} , width of J = 0 and J = 1 levels 3=4645
 Y^{90} , low-lying j-j coupled odd-group model 3=22304
 Y^{90} , splitting due to n-p coupling, from $\text{Y}^{89}(\text{d},\text{p})\text{Y}^{90}$, ang. distrib. 3=15109
 Yb^{168} , first rotational level 3=17458
 Yb^{170} , 2+, from Tm^{170} β decay theory 3=22309
 Yb^{173} , first excited states, lifetimes 3=12597
 Yb^{173} , γ -transitions to rotational states, Nilsson model 3=6177
 Yb^{173} , 351 keV 3=4577
 Yb^{176} , 4^+ level energy 3=8134
 Yb^{177} , orbit flip mag. transistors 3=2392
 Zn^{64} 3=10259
 $\text{Zn}^{64,66}$, low-lying levels 3=2491
 $\text{Zn}^{64,66,68}$, two and three-phonon 3=15106
 Zn^{67} 3=6297
 Zn^{68} , 2320 keV level 3=12590
 Zr^{90} , 1.76 MeV 0^+ level, two-photon decay search 3=2387
 $\text{Zr}^{90,91,92,94,96}$, single-particle states 3=24866
 $\text{Zr}^{90\text{m}}$ 3=15208
 $\text{Zr}^{94,96}$, neutron separation energies 3=12627
excitation
 See Nuclear excitation.
magnetic moment
 See also Gyromagnetic ratio; Molecules, nuclear coupling; Nuclear magnetic resonance and relaxation.
 Ampere Colloquium, Eindhoven (1962) 3=20629
 Ampere Colloquium, Leipzig (1961) 3=23198
 atomic level effects of nuclear mag. field 3=700
 calculation from h.f.s., intermediate coupling 3=2362
 deformed, g_A factor, from Hill-Wheeler integrals 3=12546
 deformed nuclei, odd A, $153 < A < 187$, g_R , g_K , calc. 3=7970
 electron scatt., elastic, by light nuclei 3=4626
 low-field nuc. induction, 2nd-harmonics generation 3=24500
 low-lying states, Schmidt diagrams 3=19763
 mag. dipole interact., g-factors, diff. ang. correl. study 3=10224
 odd-A distrib., systematic features analysis 3=15078
 open shell antishielding of hyperfine interact. 3=25038
 rare-earth ions 3=22607
 tables, 40 medium and heavy nuclei, g-factors 3=15086
 Ag^{105} 3=8191
 Au^{197} , first excited state 3=6458
 Cd^{111} , 247 keV state, and g-factor 3=17411
 $\text{Ce}^{137,137\text{m},139,141,143}$, alignment meas. 3=7969
 Ce^{140} , 2.083 MeV two-proton level 3=12560
 Er^{166} , 4^+ rotation level, g_R factor 3=17419
 Er^{168} , 2^+ rotation level, g_R factor 3=2391
 Er^{169} , dipole, from atomic h.f.s. meas. 3=22479
 Eu^{151} , 21.7 keV state 3=17631
 Eu^{152} (13 yr) 3=7968
 Fe^{57} 3=10225
 Ge^{71} 3=17390
 $\text{Gd}^{154,156}$, first excited 2^+ states 3=628
 H^3 , relativistic corrections 4=4556
 He^3 , form factors, by electron scatt. 3=17357
 He^3 , relativistic corrections 3=4556
 Hg 3=25054
 $\text{Hg}^{194,195,196\text{m}}$ 3=17529
 Hg^{199} , 158 keV level 3=658
 Ho^{165} 3=2362
 Li^7 , from atomic calc. 3=8187
 Li^7 , rel. to $(1p)^3$ config. 3=24840

Nucleus — contd

magnetic moment — contd

Nd^{143,145}, dipole by atomic beam magnetic resonance 3=4709

Ne¹⁹, from β -decay asymmetry with polarized nuclei 3=17427

Ni⁶¹ from n.m.r. of powder at 77°K and room temp. 3=17393

O¹⁵ dipole 3=19945

Os¹⁸⁷ 3=10225

Os¹⁸⁸, 2⁺ state, gyromagnetic ratio 3=4555

Pb²⁰⁴, 1.274 MeV level 3=19763

Pm^{143,148,149} 3=12906

Pm¹⁴⁷, spectroscopic det. 3=10463

Pr¹⁴¹ 3=2362

Pu²³⁹ 3=10462

Pu²³⁹ 3=15289

Pu^{239,241} 3=2363

Pu^{239,241} from Pu II ionization potential and spectrum h.f.s. 2=17392

Re¹⁸⁷, 206 keV state 3=24839

Sc⁴⁶ 3=2361

Sm¹⁵², first excited 2⁺ state 3=628

Sn¹¹⁹, 23.8 keV state 3=6141

Tm¹⁶⁹ 3=6355

Tm¹⁸⁹, 8.42 keV state 3=8006

V⁵¹, and three-particle model 3=19778

V⁵¹, first excited state, g factor 3=7994

W, average g-factor of first excited 2⁺ states 3=19793

W¹⁸², 2⁺ rotation level, g_R factor 3=8013

W¹⁸³ 3=10225

Xe^{129,131} 3=24838

Y⁹¹ 3=2361

magnetic resonance

See Nuclear magnetic resonance and relaxation.

models

α -model, lower levels of O¹⁷, F¹⁷ calc. 3=636

α -particle model, study using cosmic rays 3=24817

α substructure, from p, 3p3n reaction 3=19852

asymmetric rotator, intermed. coupling 3=17383

binding forces, demonstration model, using potential superposition 3=25036

cluster, shell, collective motion, for light

nuclei 3=15072

collective, asymm.-core, for odd-A nuclei 3=17386

collective effects in odd-mass nuclei 3=19747

collective model for Ne²⁰ 3=2498

collective motion, internal parameters, dynamic theory 3=22265

collective states excitation by charged particles 3=22290

collective, with interparticle interactions, in even-even nuclei 3=10209

dipole excitation by collective and shell models 3=6137

drop, fission barrier of rotating nuc. 3=6135

drop, fission threshold and fragment energies 3=6306

effective interacts. between extra-nuclear

nucleons 3=15071

eigenvalues and vectors, statistical props. 3=22262

elastic scattering, threshold effect in optical model 3=6212

even-even, α -emitting, α -distrib. on surface 3=12616

even-even, collective gyromag. factor 3=19741

even-even nuclei, excitations, theory, review 3=10204

excitation by slow charged particles 3=22288

Fermi fluid of 2 types of particles 3=15080

Fermi fluid, rel. to nucleon scatt. optical pot. 3=8083

Fermi gas, degenerate, rel. to nucleon scatt. optical pot. 3=8083

fermion systems, stability conditions, app. nuclear matter 3=18750

independent particles, and α -decay, spheroidally deformed even-even nuclei 3=12617

individual-particle with pair interactions, reduced width corrections 3=10205

interior, optical model 3=2425

light nuclei, shell theory, review 3=7963

light nuclei, surface 3=19745

liquid drop, electron inelastic scatt. 3=8081

liquid-drop, energy surface relief 3=15239

liquid drop, rotating, equil. configs. 3=10211

Nucleus — contd

models — contd

liquid drop, sharp surface, equilibrium symmetrical shapes 3=2355

and mass deviation from Bethe-Weisszacker relation 3=10202

matrix elements for β -transitions 3=2399

neutron hole states, determ., from (d, p) or (d, t) reactions 3=19762

neutron single particle levels, determ., from (d, p) reactions 3=19762

Nilsson single particle, for odd mass nuclei, 1d-2s shell 3=6126

nuclear optical potential, symmetry term 3=10217

nuclear "surface" concept 3=4550

nucleon gas, inelastic electron scatt. 3=8080

nucleon gas, superconducting, rel. to nucleon scatt. optical pot. 3=8083

nuclear matter, new research 3=24832

octupole deform. in even-even medium-mass nuclei 3=24859

optical, direct photoeffect 3=6136

optical, effect of form-factor distortion 3=22261

optical, for α -particle scatt. 3=17497

optical, for elast. and inelast. proton scatt. 3=12662

optical, for neutron interacts. with spherical

nuclei 3=24947

optical model analysis, N-nucleus scatt. 3=621

optical model in the interior of the nucleus 3=2425

optical model (p, n) cross-sections 3=669

optical model potl., effect of pairing correl. 3=6122

optical model, surface absorpt. and S-wave neutron strength function 3=2349

optical model, test by double-excitation 3=661

optical model with polynomial potential 3=2354

optical, polarization of neutron scatt. near 1 MeV 3=4644

optical potential effects on nucleon momentum distrib., pickup reactions 3=624

optical potential, isotopic spin dependence, calc., $> \sim$ MeV, and (p, n) reactions 3=19749

optical potential, non-locality 3=12544

optical, rel. to direct interaction theory for inelastic scatt. 3=2423

optical, rel. to average reaction reson. parameters 3=6213

optical, relationship with interaction theory of inelastic scatt. 3=625

optical, review 3=17388

optical, threshold effect in elastic scatt. 3=6212

optical, use for 1.5-14 MeV for neutron scatt. on Li⁶ and Li⁷ 3=2469

optical, various, strength functions and neutron polariz. 3=22260

oscillator shell, potl. energy, light nuclei 3=10200

p, hard core from p-p scatt., up to 660 MeV, phase shift 3=24723

pair-correlation model, rel. to n-p interact. 3=6003

pairing, constant temp. or energy differences 3=19743

with pairing correls., high energy behaviour 3=12550

quantitative evaporation theory for diffuse potential 3=24834

quasi-spin, collective potential energy 3=10218

quasistatic fission, equil. shapes of nuclei 3=6304

rectangular well, nonspher., infinitely deep, single-particle levels 3=6138

reduced width detm., from polarization effects in direct nuclear reactions 3=10378

rotational band structure, Peierls-Yoccoz theory of collective motion 3=19759

rotational model applied to Li⁷ 3=12549

self-consistent "classical", with Coulomb effects 3=17389

semiempirical, appl. of N-N resonance theory 3=19621

shell, collective motion, spectra calc. 3=10212

shell, d-s, structure of low-lying states 3=6128

shell, $\frac{5}{2}^-$ level in mass-13 nuclei, search 3=8132

shell, deformed region, L forbidden transitions 3=22316

shell, doublet splittings calc. 3=22258

shell, effect on (n, γ) reactions in odd Z nuclei 3=6273

shell, independent particle, book 3=12545

shell, interaction matrix element 3=10210

shell, investigation using deuteron stripping 3=22356

Nucleus — contd

models — contd

- shell model and collective nuc. vibs. 3=22264
 shell model, calcs. of α -decay rate near Pb^{208} , from Po^{212} 3=19806
 shell model, effective interacts. 3=15v71
 shell, neutron states, single-particle, energies obs. 3=10247
 shell, Nilsson, for Au^{192} odd-particle configs. 3=22350
 shell, one- and two-hole excitation, rel. to π capture 3=4657
 shell, real potential well, computer code 3=2352
 shell, rel. to neutron strength function 3=22259
 shell, rel. to rotation-vibration model 3=4553
 shell, residual interact. and pairing energies 3=10214
 shell, s-d, vibrations rel. to particle interact. 3=4554
 shell, SU3 classification, matrix elements 3=12552
 shell, self-consistent potential and non-singular two-body interaction, calc. 3=17387
 shell single-particle, rel. to γ -ray scatt. 3=17449
 shell, spin-orbit bond in photonuclear reactions 3=4613
 shell structure, rel. to photoprotons 3=10328
 shell, testing with beams from Van de Graaff accel. 3=22268
 shell, 2s, 1d, energy spectra calc. 3=12553
 shell, vibr. levels excitation by particle 3=7985
 single-nucleon model 3=19744
 single particle bound state widths and optical model potential 3=22280
 single particle strengths 3=19746
 spherical even-even, simple pairing and long-range quadrupole force 3=2371
 statistical, including correlations 3=15083
 strongly-deformed nuclei, "superfluid nuclear model" 3=10207
 study by nuclear reactions, review 3=24915
 supercond., in α -decay theory 3=2398
 superconducting, approximation methods 3=17384
 superconducting, self-consistent field separation 3=12547
 superfluid, and $225 \leq A \leq 255$ props., calc 3=24829
 symmetric two-shell, for pairing and monopole-monopole interacts. 3=15v75
 transuranic, unstable, equil. deformations 3=19752
 Ar^{41} , 40 states, shell model analysis 3=7990
 Au^{197} , α substructure, from p, 3p3n reaction 3=19852
 $\text{Be}^9 + \alpha$ system, $\text{Be}^9(\alpha, n\gamma)\text{C}^{12}$ study 3=10391
 Be^9 , inelastic electron scatt., three models 3=2437
 Bi, α -particle structure, and emission, on p bombardment 3=17381
 C, optical, integrated, potentials 3=22374
 C^{12} , α -cluster model 3=12551
 C^{12} , diffuse-surface optical, proton scatt. 3=6236
 C^{12} , giant dipole resonance, shell and collective models 3=19769
 C^{12} , inelastic electron scatt., three models 3=2437
 $\text{C}^{14}, \text{N}^{14}$, intermediate-coupling, configuration-mixing calc. 3=12557
 C^{12} , nuclear matter distrib. 3=6036
 C^{12} -p inelastic colls. at 660 MeV 3=4643
 C^{12} , quasi-deuteron model 3=7965
 Ca, optical, in neutron elastic scatt. 3=672
 Ce^{140} , 2.083 MeV two-proton level 3=12560
 $\text{Cl}^{35,37}$, shell, rel. to muon absorption 3=10368
 Li^6 , as $\alpha + d$, and electrodisintegration 3=17455
 Li^6 , from electron excitation 3=22368
 $\text{Li}^6 + \text{Li}^6$ complex, as explanation of $\text{Li}^6 + \text{Li}^6$ reactions, 2 MeV, product energy and angle distrib. 3=22431
 Li^6 , p-proton, rel. to proton scatt. 3=2442
 Li^7 , from $\text{Li}^7(p, n)\text{Be}^7$, n polariz., ang. distrib., $E_p = 4.5$ MeV 3=17462
 Mn^{55} , shell, incl. neutron-proton interact. 3=6129
 Mo, optical, and neutron scatt., 14 MeV 3=673
 N-N pot., velo. depend, and nuclear matter saturation 3=24830
 N^{13} , shell, energy level predictions rel. to expt. 3=635
 N^{14} , 6.44, 7.03, 9.17 MeV states, shell 3=8094
 Nb^{93} , α substructure, from p, 3p3n reaction 3=19852
 Ne^{20} , energy levels of first rotational band 3=4565
 Ni^{62} , three-phonon group 3=6134
 O, optical, rel. to elastic proton scatt. 3=6235

Nucleus — contd

models — contd

- O^{16} , α substructure, from p, 3p3n reaction 3=19852
 $\text{Pb}^{202,204,206}$, pairing, exact, and energies and excitation spectra 3=19751
 Pb^{208} , 3 $^-$ state, configuration mixing 3=8020
 Rh^{104} , shell model configurations 3=4570
 Rh^{104m} , shell model configurations 3=4569
 Si^{30} , weak-coupling unified model, energy levels calc. 3=6167
 Sn, single interaction, finite range, and pairing props. 3=17380
 V^{51} , α substructure, from p, 3p3n reaction 3=19852
 V^{51} , three-particle, from electric quadrupole and mag. dipole data 3=19778
 V^{51} , shell-model calc. of electron inelastic scatt., cross-section 3=364
 $225 \leq A \leq 255$ props., calc., superfluid model 3=24829
- size
 density distrib., Fermi-Thomas K-matrix method 3=15074
 EO transitions, collective, rel. to nuc. shape 3=24843
 finite size effects in β -decay 3=646
 potential, long-range 3=15070
 radius calc., function of neutron and proton nos. 3=22272
 radius parameter re-eval. 3=10385
 surface shape investigation method 3=15087
 zero-point vibs. effect on radius 3=12556
 C^{12} charge distribution radius 3=19841
 Ca^{40} , zero-point vibs. effect on radius 3=12556
 He^3 3=12519
 He^4 , density distrib. 3=7940
- O^{16} , reaction matrix calc. 3=2357
 Z = 12-50, 14 elements, from muonic X-rays 3=15311
- spin and parity
 See also Gyromagnetic ratio; Molecules, nuclear coupling.
 cooling by paramag. electron spins in lattice 3=19077-8
 even-even, Ne^{20} - S^{32} levels, from γ ang. correl. on p scatt. 3=24852
 heavy nuclei, effect isobaric spin purity on nuclear potentials 3=10223
 isobaric spin quantum no., heavier nuclei 3=633
 mass-13 nuclei, search for f^- level 3=8132
 "negative levels", spin establishing method 3=12571
 octupole deform. in even-even medium-mass nuclei 3=24859
 relaxation, rotating pair of nuclei 3=15951
 A^{40} , 2nd, 3rd, 9th, 11th states 3=6250
 Al^{26} , 5.3-6.2 MeV levels 3=22372
 Al^{25} , 3.70 MeV level, by $\text{Mg}^{24}(p, \gamma)\text{Al}^{25}$ at 1.49 MeV reson. 3=19772
 Al^{26} , 2.07, 1.85, 1.76 MeV levels 3=19773
 Al^{27} , spins of 2.21 and 3.00 MeV levels 3=6140
 B^{10} 3=667
 B^{10} , 5.11 and 5.16 MeV levels 3=24860
 B^{11} , 2.13 MeV first excited state, parity 3=7986
 B^{12} , first 4-excited states 3=4664
 B^{12} , 1.67 MeV level 3=6278
 Ba^{131m} 3=8001
 Ba^{134} , spins of excited states 3=15114
 Ba^{134} 3=24903
 Ba^{136} 3=4572
 Ba^{138} 3=2360
 Be^7 3=12522
 Be^7 , positive parity state 3=17460
 Be^8 , compound nucleus, 19.9 and 22.2 MeV 3=17461
 Be^8 , 18.9 MeV level 3=17480
 Be^9 3=12691
 C^{12} , 17.77 and 18.34 MeV levels 3=19850
 C^{13} , search for f^- level 3=8132
 Ca^{40} 3=6237
 Ca^{40} , 2, 3, 4th excited states, spins, from $\text{K}^{39}(p, \gamma)\text{Ca}^{40}$ γ, γ correl. 3=19776
 Ca^{44} , three levels, from d, p, γ correl. in (d, p) reactions 3=19777
 Ca^{42} 3=10257
 Ca^{44} , excited levels 3=12623
 Cd^{112} , spins 3=24867
 Cd^{114} , from d, p stripping, p ang. distrib. 3=17405
 Ce^{140} levels, from La^{140} decay γ cascades 3=22307
 Ce^{140} , 1596, 2083, 2410, 2520 keV levels 3=24868
 Co^{58} 3=15143

Nucleus — contd

spin and parity — contd

Co^{60m} 3=17432
 Cr⁵¹ 3=24972
 Cr⁵³ 3=24972
 Cr⁵⁴ 3=24972
 Cr⁵⁴, first four excited states 3=19866
 Cr⁵⁵ 3=24972
 Cs¹³³ levels, from Ba¹³³ decay, by e capture 3=19820
 Dy¹⁵⁵ ground state 3=19823
 Dy¹⁵⁸ 3=10307
 Dy¹⁵⁸ 3=10308
 Dy¹⁵⁹ 3=4597
 Er¹⁶⁵, ground state 3=2415
 Er¹⁶⁶ 3=10269
 Er¹⁶⁶, excited states 3=17419
 Eu¹⁵¹, 21.7 keV state 3=17631
 Eu^{152m} 3=15085
 F¹⁷, 5.47, 5.67, 5.84 MeV levels 3=2446
 F¹⁸ 3=6289
 F¹⁹, spins, 9.07, 2.78, 1.35 MeV levels 3=19843
 F²¹, ground state spin 3=12621
 Gd¹⁵⁵, from conversion- γ ang. correl. meas. 3=17417
 Gd¹⁵⁴ 3=3173
 Ge⁷¹ 3=17390
 Δ H^{3,4} hyperfragment 3=22277
 He⁴, virtual state 3=2331
 Hf¹⁷⁸, 20 levels 3=8011
 Hf^{180m} 3=6179
 Hg¹⁹⁹, from Tl¹⁹⁹ and Au¹⁹⁹ decay 3=658
 Hg²⁰³, ground-state 3=10314
 Ho¹⁵⁹ 3=4597
 Ho¹⁶¹ 3=10308
 I¹³¹ 3=22334
 In¹¹⁵ 3=7999
 In¹¹⁵, excited levels 3=17437
 In¹¹⁷, 45 min. ground state, spin, by atomic beam mag. reson. 3=17391
 Ir¹⁸⁶, 15.8 hr 3=10313
 Ir¹⁸⁸, excited levels, from Pt¹⁸⁸ decay 3=8053
 K⁴¹ compound nucleus 3=7991
 La^{138,137} 3=7969
 La¹⁴⁰ 3=2360
 Li⁷, 5.7, 6.8 MeV levels 3=19766
 Δ Li⁸ 3=10230
 Δ Li⁸ hyperfragment 3=22277
 Lu¹⁷² 3=15122
 Mg²⁴ excited levels 3=19771
 Mg²⁴, excited levels 3=17468
 Mn⁵⁵ 3=6237
 Mn⁵⁵, first 3 excited states 3=22302
 Mo^{93,95-7}, ground and first excited states 3=22271
 Mo⁹⁴, 1.57 MeV state 3=6168
 Mo⁹⁶, spins and parities, 1610-2410 keV levels 3=4591
 Mo⁹⁶, 2730, 2410, 1950, 1850 keV levels 3=22305
 N¹³ 3=635
 N¹³, from proton scattering on C¹² 3=24928
 N¹³, levels near 7 MeV 3=22292
 N¹³, search for $\frac{1}{2}^-$ level 3=8132
 N¹⁴, 5.83 MeV state, parity 3=17401
 N¹⁴, odd-parity states, shell model calc. 3=24861
 N¹⁴, parities for 3.95 and 7.03 MeV levels 3=4566
 N¹⁴, 10.22 MeV level 3=17399
 N¹⁶, ground and 1st-excited levels 3=24862
 Na²¹, spin, 1st excited state 3=10377
 Nb^{94,94m} 3=6168
 Nd¹⁴⁴, 2.18 MeV level, parity 3=12633
 Ne¹⁹, spins of 1st and 2nd excited levels, spin sequency 3=15102
 Ne²⁰ 3=22380
 Ne²⁰, parity of 4.97 MeV level 3=10255
 Ne²⁰, 13.332 and 13.440 MeV levels 3=15193
 Ne²¹, 0.345, 1.73 MeV states 3=12621
 Ne²² 3=2500
 Ni^{58,60,62} 3=6281
 Ni⁶⁰, 2.05 MeV state, zero spin 3=17408
 O¹⁵ 3=19945
 O¹⁵, 8.926 and 8.988 MeV levels 3=12582
 O¹⁹, 1st-excited state, parity 3=24863
 Os^{188,190}, lower excited states 3=17421

Nucleus — contd

spin and parity — contd

P³⁰ 3=6246
 P³¹ 3=15195
 P³¹, resonance levels 3=19774
 P¹¹⁰, 2⁺ state 3=24894
 Pa²³³ 3=4605
 Pd isotopes, odd-A 3=19783
 Pd¹⁰⁵, 319 keV state 3=6169
 Pm¹⁴⁷, spectroscopic det. 3=10463
 Pm¹⁴⁸ 3=12906
 Pm¹⁴⁸, spins of 3 levels 3=14116
 Po²¹², isomeric state 3=24889
 Po^{212m} 3=22311
 Pr¹⁴¹ 3=2410
 Pr¹⁴¹ 3=7969
 Pr^{141,3,5}, ground-state spins, pairing model 3=12555
 Pr¹⁴² 3=2360
 Pr¹⁴³, ground, 1st and 2nd excited states 3=10297
 Pr¹⁴⁴, from β , γ circular polarization and correlation 3=22270
 Pr¹⁴⁴, ground state 3=12632
 Pr¹⁴⁴, ground state, from β decay, β - γ directional correl., energy depend. 3=19753
 Pr¹⁴⁴ levels, from β - γ correl. 3=22308
 Pu^{238,240} 3=15129
 Re¹⁸⁷, 206 and 686 keV excited levels 3=22348
 Rh¹⁰² 3=15146
 Rh¹⁰⁴ 3=4570
 Rh¹⁰⁴, <900 keV excitation energy 3=6272
 Rh^{104m}, 4.4 min. isomer 3=4569
 Rh¹⁰⁵, ground, 475, 795, 960 keV levels 3=7997
 Ru¹⁰² 3=15147
 S³², levels between 1 and 2 MeV 3=7988
 S³², levels, 640-1150 keV, from P³¹(p, γ)S³² 3=22377
 S³², 9.185, 9.267, 9.367 MeV levels 3=6242
 S³², 9.39-4.70 MeV levels 3=7989
 Sc⁴⁴, ground state, isomeric level 3=12623
 Sc⁴⁶ 3=2361
 Sc⁵⁰ 3=7992
 Si²⁸ 3=2499
 Si²⁸ 3=12662
 Si²⁸ 3=19847
 Si²⁸ excited levels 3=19771
 Si³⁰ 3=24971
 Si³⁰, from d, p stripping, p ang. distrib. 3=17405
 Sm¹⁴⁸ 3=12906
 Sm¹⁴⁸ 3=19821
 Sm¹⁴⁸, spins of 9 levels 3=15116
 Sm¹⁴⁸, spins of 15 levels 3=15117
 Sm¹⁴⁸ states, from Eu¹⁴⁸ decay γ -rays 3=10265
 Sm¹⁴⁹, low-energy neutron resonances 3=2468
 Sm¹⁵⁰, second-level spin, from γ -ray decay 3=24870
 Sm¹⁵², 1531 keV state 3=3173
 Sn¹¹⁶, 1.72 MeV level 3=4568
 Tb¹⁵⁵ 3=19823
 Tb¹⁵⁹ 3=2414
 Tb¹⁶⁰, β -decay, Dy¹⁶⁰ 3=19790
 Tc⁹⁴, spin 3=15145
 Te¹²⁴, 2691 keV level, spin and parity 3=15113
 Th²³⁰ 3=15129
 Ti⁴⁸, ground state and 377 keV level 3=17429
 Ti⁴⁷, 160 keV level 3=12587
 Ti⁴⁸, 3240 keV level 3=19812
 Tl isotopes, isomeric levels 3=22310
 U²³² 3=4581
 U^{234,235} 3=15129
 U²³⁵ 3=4606
 V⁵¹ 3=6297
 W¹⁸⁴ 3=8014
 Y⁸⁹ 3=10363
 Y⁹¹ 3=2361
 Yb¹⁷¹ 3=8007
 Zn⁶⁷ 3=6297
 Zr^{90m} 3=17432
 Zr^{91,92}, from d, p stripping, p ang. distrib. 3=17405

theory

See also Nuclear forces.

α -particle binding energy, variational calcs. 3=12558
 β -vibration, rel. to spurious zero-frequ. state 3=2351

Nucleus — contd

theory — contd

- binding energy, Weizsäcker formula 3=15083
- Brueckner—Goldstone, reaction matrix G calc. 3=4551
- charge distrib. fluctuations, rel. to electron scatt. 3=8080
- collective degrees of freedom, purity of sepn. 3=7981
- collective octupole states in shell model 3=12576
- collective props., j^{π} configs. 3=620
- complex, high energy deuteron scatt. 3=12698
- Coulomb excitation, rel. to cpd. nucleus 3=12572
- deformation energies, heavy nuclei 3=15073
- deformation, var. with rotation 3=17394
- deformed even nuclei, energies of collective states 3=6154
- deformed, light nuclei, nucleon motion 3=10203
- deformed nuclei, compressibility 3=6159
- deformed nuclei, multiple Coulomb excitation 3=12574
- delta-function potential in box 3=7117
- effective Hamiltonian, rel. to energy gap 3=10213
- effective interactions, shell-model analysis 3=2373
- effective range, vel. depend. potls., 3=623
- energy, Brueckner's theory, correction 3=10201
- energy, density distrib., Fermi—Thomas K-matrix method 3=15074
- even—even, vibr. spectra rel. to interparticle effects 3=10209
- excitation of vibr. levels, collective states 3=7985
- f-sum, effect of hard core 3=2356
- $f_{7/2}$ nuclei, energy levels calc. 3=15092
- $1f_{7/2}$ nuclei, seniority mixing 3=626
- fine structure of nuclear masses in α -decay 3=6194
- hard core simulation by velocity depend. 3=7966
- Hartree—Fock, tensor-force, spin—orbit coupling 3=22254
- hyperfine structure, μ -mesic atoms 3=10208
- interactions and coupling schemes 3=6123
- isobaric spin quantum no., heavy nuclei 3=633
- kinematic props. of deformed nuclei 3=12546
- light mirror nuclei, lower excited levels 3=22284
- light nuclei, shell, collective motion, cluster models 3=15072
- many-body problem, regular but vel. depend. forces, perturbation theory 3=7967
- many-body problem with nonuniform density 3=6131
- n excess, $A > 40$, due to isobaric spin term in potential, from (p, n) reactions 3=19750
- non-spherical, collective excitations 3=10238
- non-spherical, even—even, rotational states 3=10206
- neutron evaporation from excited nucleus 3=7980
- neutron widths, strength functions 3=19760
- nuclear matter, binding energy calc. by ref. spectrum 3=12554
- nuclear matter, critical temp. theory 3=10216
- nuclear matter, effect of velocity depend. forces 3=6132
- nuclear matter, energy-density relation 3=2353
- nuclear matter, ground state, surface props. 3=15082
- nuclear matter, ground state, volume props. 3=15081
- nuclear matter, rel. to different expt. potentials 3=6127
- nuclear matter, single-particle energies, reference spectrum method 3=24831
- nuclear matter, superfluid behaviour 3=6133
- nuclear matter, three-body effect to all orders 3=19748
- nuclear matter, two nucleons, Bethe—Goldstone eqn. 3=22266
- nuclear matter, two nucleons, Bethe—Goldstone eqn. 3=22267
- nucleon correlations, from K^{-} -meson absorption 3=4660
- nucleon momentum distrib., optical potential effects, pickup reactions 3=624
- odd-A, mag. moment distrib., regularities 3=15078
- odd—even shift, $K = 0$ rot. bands of odd nuclei 3=10243
- odd-mass, asymmetric rotator model 3=17383
- one-pion exchange contrib. to optical potl. 3=622
- optical model potl., effect of pairing correl. 3=6122
- optical model potl. Heisenberg forces 3=621
- optical potential, high-energy, surface corrections 3=10335
- optical potl., nucleon wave inside nucleus 3=6121
- optical potl., radial distrib. of imaginary part 3=12543
- pairing correls. of neutrons and protons 3=12542
- pairing energies of neutrons and protons 3=10199
- pairing energies, spherical and deformed nuclei 3=22263

Nucleus — contd

theory — contd

- pairing force Hamiltonian, exact eigenstates, restricted class 3=7962
- periodicity and structural development 3=10202
- phase shifts for singular-type N—N triplet-even potls. 3=22255
- phase transition and level density 3=10215
- π photoprod. cross-section shell model calc. 3=12654
- potential energy, oscillator shell model 3=10200
- rare-earth, deformed, E1 transitions 3=6152
- rare-earths, rotation— γ - vibration interaction 3=2381
- reaction matrix theory, finite nucleus, by separation method 3=2357
- reactions, average resonance parameters, R-matrix theory 3=6213
- review 3=12548
- rotation, rel. to deformal potential well 3=15079
- rotational states, intrinsic symmetries 3=2374
- S-wave neutron strength function, effect of surface absorpt. 3=2349
- scattering from odd-mass nuclei 3=19747
- screening effect for forbidden β -spectra 3=8027
- spherical nuclei, vibr. states, low-energy 3=2372
- spin—orbit interact. in scatt. problems 3=581
- statistical distrib. of energy levels 3=9
- statistical mechanics of superfluid nuclear matter 3=19742
- structure, interrel. with elem. particle physics 3=540
- superconducting Fermi fluid, e.m. transitions 3=23795
- surface oscillations, semi-classical description 3=22264
- three and four-body, ground state, exact calc. 3=2358
- three-nucleon clusters in nuclear matter 3=4552
- two-quantum processes 3=24850
- translational motion 3=627
- tritons, wave function for ground state 3=4473
- 2^{+} states, structure, in even—even nuclei 3=7984
- velocity depend. potl., binding energies 3=17382
- vibrational motions, effective potl. 3=2375
- Whittaker functions, tables of 3=13995
- Wigner coeffs. for SU₃ group, p-shell fractional parentage coeffs. 3=6124
- zero-point vibs. and nuclear surface 3=12556
- Al²⁷ 3=6128
- Al²⁷, level density formulae in reaction theory 3=17481
- Al²⁷, μ -mesic atom, nuclear h.f.s. 3=10208
- B¹¹, unified model of energy level scheme 3=2382
- Be⁷, matrix elements, electron capture rate in stars 3=2404
- Bi²⁰⁹, μ -mesic atom, nuclear h.f.s. 3=10208
- Bi²¹⁰, energy levels using shell-model 3=24875
- Bi²¹⁰, stripping reaction data, shell-model analysis 3=24876
- Bi²¹⁰, tensor forces and energy levels 3=24874
- C¹², internal momentum distrib. 3=7965
- C¹³, potential, effective-range analysis 3=24954
- C¹⁴, ground-state config. using zero-range force 3=12557
- Ca⁴⁰ 3=6128
- Ca⁴⁰, Brueckner charge density 3=22367
- Ca⁴⁰, Brueckner—Gammel—Weitzner theory 3=6130
- Cl³⁵ 3=6128
- Cu⁶³ 3=6128
- Cu⁶⁵, model for low-lying levels 3=19780
- Eu^{147, 149, 151}, collective motion and I^{-} -forbiddenness 3=6175
- F¹⁸, residual pair forces 3=22257
- F¹⁹ 3=6128
- Fe^{55, 58}, shell-model states assignment 3=24833
- He³, radius, Coulomb energy 3=12519
- He³, bound state as 2-body problem 3=2332
- Hf¹⁷⁸, orbit flip mag. transitions 3=2392
- In¹¹⁵ 3=7999
- Li⁷, e.m. props., rel. to (1p)³ config. 3=24840
- Li⁷, rotational model 3=12549
- Mg²⁴, axially asym. deformation, stability 3=24844
- Mg²⁴, energy spectrum by shell model 3=12553
- Mg²⁴, rotational levels 3=17404
- Mg²⁴, shell, collective motion, spectra 3=10212
- Mn⁵⁵, semiatomic model 3=15077

Nucleus — contd
theory — contd

- N—N pot., velo. depend, and nuclear matter saturation 3=24830
- N¹³, intermediate-coupling shell-model calc. of levels 3=22293
- N¹⁴, ground-state config. using zero-range force 3=12557
- N¹⁴, odd-parity states, shell model calc. 3=24861
- N¹⁴, shell model, lower levels 3=15076
- Ne²⁰, energy spectrum by shell model 3=12553
- Ne^{20,22}, axially asymm. deformation 3=24844
- Ni⁵⁸ 3=6128
- Ni⁶⁰, energy gap, using effective Hamiltonian 3=10213
- Ni^{62,63,65}, shell-model states assignation 3=24833
- O¹⁶ 3=6128
- O¹⁶ ground state, Hartree—Fock calc. 3=6139
- O¹⁴, low excited states in SU3 scheme 3=10253
- O¹⁶, reaction matrix calc. of binding and single particle energies 3=2357
- O¹⁸, deformation parameter, electron scatt. 3=10331
- O¹⁸, wave-function of ground state 3=10381
- O¹⁸, residual pair forces 3=22257
- P³¹ 3=6128
- Pb²⁰⁸, Brueckner—Gammel—Weitzner theory 3=6130
- Pb²⁰⁸, two-hole two-particle configs. 3=10275
- Po²¹⁰, energy levels using shell-model 3=24875
- Po²¹² isomer, configuration 3=24889
- Pr-isotopes, pairing model 3=12555
- S³² 3=6128
- S³², deformation parameter, electron scatt. 3=10331
- Si³⁰, collective vibs. 3=6167
- Sm¹⁵², collective gyromag. factor 3=19741
- Sn^{117,119}, asymmetric rotator model 3=17383
- Ta¹⁸¹, μ -mesic atom, nuclear h.f.s. 3=10208
- Te^{123,125}, asymmetric rotator model 3=17383
- Xe¹²⁹, asymmetric rotator model 3=17383
- Y⁹⁰, j—j coupled odd-group model 3=22304
- Yb¹⁷⁷, orbit flip mag. transitions 3=2392
- Zr^{90,91,92,94,96}, single-particle states 3=24866

Oceanography

See also Liquid waves; Seawater.

- absorption of sound, rel. to eddy viscosity in ocean 3=9558
- acoustic ambient noise, spectra and sources 3=6951
- acoustic signals, ocean waves effects 3=11385
- acoustic studies by H₂—O₂ explosions 3=9552
- Arctic Ocean, underwater sound propagation 3=13652-3
- artificial harbour design 3=18953
- ASWEPS for automated data collection 3=5186
- β -plane ocean, flow patterns 3=16204
- bottom layer, compressional vel. det., dispersion phenomena 3=6950
- coastal lagoon, ambient noise. 3=25863
- containers, for tests at great sea depths 3=3443
- deep-sea bed backscatt. of explosive sound 3=3444
- deep-water surface waves 3=1424
- fluids, stratified, waves, theory 3=21295
- Knudsen ambient noise spectra, origin 3=16201
- light in the sea 3=6952
- lunar gravitational tides, rel. to moon's interior 3=23670
- meteorite impact formation of ocean basins? 3=11384
- noise model, spatial-correl. functions 3=3445
- pile-up and drive-away phenomena, sea-level variations 3=18485
- radiant energy varn. rel. to ocean temp. 3=9010
- scattering, light, meas., submersible water, design theory 3=19023
- sea surface, scattering and reflection of acoustic waves 3=9559
- sea surface, scattering of sound, rel. to roughness 3=1423
- sea surface waves, eqn. of state where large waves demolish small 3=9013
- sea waves, refraction, numerical calc. 3=13654
- SOFAR studies, long-range, in South Atlantic 3=11386
- sonar pulses attenuation in sea-water 3=21029
- sound attenuation, low freq., in deep ocean. 3=25862
- sound refl. from surface, statist. characteristics 3=14269

Oceanography — contd

- sound reverberation at surface and bottom 3=16202
- sound speed calculations, oceanographic data, precision 3=18487
- sound transmission, 90-km test, Arctic Ocean. 3=25864
- spectra of light in the sea-depths 3=9011
- storms, swell, directional recording 3=16203
- surface waves under layer of ice 3=1422
- synthesis with geomorphology, limnology and geo-ecology 3=11373
- temp. microstructures, at sea, thermister probe, fast response 3=14402
- thermometer, resistance, Pt, deep sea, short time const. 3=19053
- tidal waves, determ. from harmonic const. 3=18484
- tides and internal structure of earth 3=21025
- tides, time-lag and friction 3=21092
- tidal currents, frictional forces calc. 3=16198
- underwater transducer, power meas. 3=9567
- wave atten. with depth, meas. 3=16199
- wave generation by wind, theory, recent developments 3=3446
- wave scattering, initial, by inhomogeneous medium 3=7272
- waves, Hamiltonian method 3=23580
- waves, wind, crit. height values, calc. 3=18483
- wind caused wave action, freq. spectrum of energy 3=9012

Optical activity

See Optical rotation.

Optical constants

See also under individual headings, e.g. Absorption; Reflectivity.

- absorbing materials, selective, meas. using i.r. spectrometer 3=9598
- beryl, meas. using a reflection method 3=10905
- coatings, reln. to spectral emittance 3=25432
- crystals, circular optic axes 3=23033
- determination from reflection bands using dispersion relations 3=16790
- films, solid, meas. in vacuum 3=13147
- metallic surface, rel. to thermal emissive power 3=286
- metals, polarimetric method 3=11943
- NBS VUV research programme 3=9591
- oxide films on Si 3=25439
- racemates and antipodes, rel. to electron irradi. from different sources 3=2996
- from reflectance ratios by geometric construction 3=6640
- from reflection and transmission coeffs. 3=18961
- metals, rel. to electron microcharacteristics 3=15467
- metal surfaces, nearly perfect, meas. methods 3=23500
- one-angle reflection technique, evaluation 3=21517
- semiconductors, IV and III—V groups, u.v. dielec. const. 3=10908
- semiconductors, optical and nonradiative transitions, temp. depend., calc. 3=23032
- semiconductors, single crystals, transmission meas. 3=23041
- solids, vacuum u.v., rel. to electron energy loss 3=8578
- ultraviolet, meas. by spectrophotometer 3=18994
- Ag crystals, effect of vacuum annealing, Ar-ion bombard. 3=20435
- Ag, free electron and band theory 3=2986
- Ag thin films, rel. to heat treatment 3=13146
- Al elimination of oxide film effects 3=15646
- Al, vacuum u.v., Drude-like model 3=914
- Au films 3=13147
- Au thin films, rel. to heat treatment 3=13146
- Au—Ni alloys 3=8580
- CCl₄, liquid, from i.r. reflection meas. 3=16624
- CS₂, liquid, from i.r. reflection meas. 3=16624
- CdS, bound exciton complexes, props. 3=6651
- CeB₆, and energy spectra 3=20437
- Co films, i.r. meas. 3=10919
- Co films, rel. to magneto-optical effects 3=10918
- Cr₂O₃, ion pair model, Oguchi analysis 3=25503
- Cu, free electron and band theory 3=2986
- Cu thin films, rel. to heat treatment 3=13146
- Fe films, i.r. meas. 3=10919
- Fe films, rel. to magneto-optical effects 3=10918
- Ge, compensated heavily doped, meas. 3=2988
- Ge, extreme u.v. 3=20436
- Ge, liquid, from reflection spectrum 3=14167

Optical constants — contd

- Ge, rel. to electron plasma frequ. 3=2987
 In, 0.7–10 μ , evap. mirror coatings 3=22676
 K films, 20° to 60°C 3=25437
 K halides, intrinsic, rel. to collective excit. 3=25433
 K, Drude theory analysis 3=17975
 K, liquid and solid, 0.365–2 μ meas. 3=17974
 KD_2PO_4 3=17943
 LaB_6 , and energy spectra 3=20437
 $NaBrO_3$, $n(\lambda)$, $k(\lambda)$, i.r., from reflection spectra 3=20438
 $NaClO_3$, $n(\lambda)$, $k(\lambda)$, i.r., from reflection spectra 3=20438
 Ni films, i.r. meas. 3=10919
 Ni films, rel. to magneto-optical effects 3=10918
 Pb, 0.7–12 μ , rel. to cond. electron data 3=22677
 Pd–Ag solid solutions, n and k rel. to Ag concentration 3=2991
 Pt reflecting films for vacuum u.v. 3=19005
 Pt in Rh, solid solutions, 0.01–1.5 at.%Pt 3=13153
 Rb films 3=18390
 $Sc_2O_3[SiO_4]$ 3=13485
 $Sc_2Si_2O_7$ 3=13485
 Te, liq., 4000–23000 cm^{-1} meas. 3=14168
 Ti, i.r. meas., rel. to electron groups 3=17977
 TiO_2 , rutile, bibliography 3=17963
 V, i.r. meas., rel. to electron groups 3=17977
 ZrO_2 films meas. 3=8577

Optical films

- See also Filters, optical.
 alkali metals, absorption light, selective photoelectric effect 3=20466
 alkali metals, properties 3=18385–90
 anti-reflection, evaporation material with refractive index 1.69 3=11928
 beam dividers, 1, 2, 3 coatings 3=21559
 dielec. multilayers, high u.v. reflectivity 3=11315
 dielectric multilayer coatings for metal mirrors 3=11930
 dielectric systems, multilayer, spectral reflectance curve 3=14359
 Drude formulae, experimental verification 3=14358
 inhomogeneous, use of Vašíček procedure 3=1826
 interference, refractive index meas. 3=11917
 measurement of thickness and refr. index by ellipsometry 3=24062
 metal, Fresnel and complex energy amplitudes 3=9602
 metal on glass, reflection at interface, phase change 3=24044
 on metal surfaces, use of ellipt. polarized light 3=14357
 metal, thin, complex amplitudes 3=3884
 metallic, Airy formulae 3=19006
 metals, optical consts. rel. to wavelength 3=10902
 multi-layer coating, known reflectivity, calculation 3=1827
 multilayer dielectric films, theory 3=14360
 multilayer, dielec., for Fabry–Perot interferometry in u.v., visible 3=19003
 nonabsorbing, Vašíček procedure appl. 3=1825
 pair, semireflecting, transmission-like refln. fringes 3=9609
 plane-parallel layers, nonlinear theory 3=16787
 protective, for mirrors, evaporated CeO_2 and SiO_2 3=11927
 reflection and transmission of plane-parallel layer 3=9605
 spectral emittance rel. to optical props. 3=25432
 thickness meas. by Savart's plates, auto-collimation 3=21527
 transmission phase-shifts prodn., meas. 3=14361
 weakly absorbing films, phase changes by total internal reflection 3=5527
 Ag, for Fabry–Perot interferometer in i.r. 3=11934
 Al, evap. in u.h. vac., i.r. reflectance 3=20443
 Al, preparation and properties 3=9603
 Al, reflectivity 3=23039
 Al, vacuum u.v. reflectance 3=11883
 Au, for Fabry–Perot interferometer in i.r. 3=11934
 Au, preparation and properties 3=9603
 CeO_2 – CeF_3 , evaporated, refractive indices 3=23035
 Ge, preparation and properties 3=9603
 Ge–ZnS, i.r. props. 3=10952
 MgF_2 , on Al, reflectance, minimum, 17 μ , after heating in vacuo 3=9601
 MgO surface, for reflectance standard 0.3–2.6 μ 3=1786
 Pt preparation and properties 3=9603

Optical films — contd

- Pt, reflecting, for vacuum u.v. 3=19005
 Re on Si, polarized thermal light emission 3=17380
 Se, for i.r. polarization, prep. 3=24060
 Se, optical constants 3=25438
 SiO_2 on Al mirrors, effect of u.v. irradiation on far u.v. reflectance 3=19004
 UF_6 on UO_2 , interference, kinetic deriv. 3=24042
- Optical images**
 See also Aberrations, optical; Resolving power, optics.
 Abbe theory, elementary approach 3=24009
 breakdown of one-to-one correspondence bet. image and object 3=1798
 circular phase objects in partially coherent light 3=14317
 concave gratings at grazing incidence, ray tracing 3=24055
 contrast, effect of stop location 3=14321
 contrast transfer function, imperfect systems 3=1797
 definition, "microcontrast" concept 3=11955
 evaluation, using transfer function, review 3=11887
 eye media, contrast transfer function 3=9303
 formation, rel. to coherence pattern of objects 3=9582
 frequency response techniques appl. 3=16743
 lens, phase retrieval in squaring operation 3=7311
 magnification beyond Rayleigh's limit 3=14316
 measurement by Fresnel transformation 3=16742
 phase information in squaring operation 3=7310
 photoconductive thermoplastic recording 3=19030
 photographic, modulation transfer function, meas. 3=21577
 point spread function, rel. to other parameters 3=1800
 position meas. by polarimetry, for small images 3=21572
 shadow visibility, radiant point method 3=14320
 sharpness meas. 3=11901
 transfer functions, approx., assessment 3=11890

Optical instrument testing

- aberration coeffs. of higher orders 3=16734
 astronomical systems, Hartmann test 3=9580
 common path interferometer, for large optics 3=11935
 contrast transmission function, meas. using gratings 3=268
 focal length, equivalent, meas. using biprism 3=3866
 focal length, negative or weak positive power 3=18963
 lens frequency response function, direct meas. 3=7362
 lenses, longitud. aberr., meas. in extra-axial region 3=237
 mirrors, paraboloidal, null corrector 3=7305
 mirrors, with common-path interferometer 3=14364
 new techniques for optical components 3=16748
 prisms, fused silica, inhomogeneity compensation 3=21528
 review of modern methods 3=244
 Ronchi, diffraction theory 3=24052

Optical instruments

- Some instruments are listed separately, e.g.
 Refractometers.
 atmospheric emissions, upper, technique 3=3509
 autocollimator, two-channel, recording 3=16746
 beam splitters (50/50%), dielectric-film type 3=7321
 binocular eyepieces, wide-field large-pupil 3=16739
 centreing, mounting error effect 3=11885
 conference, London (1961) 3=14308
 decentring tolerances, computation 3=1791
 diffraction, theoretical represent. 3=265
 "effective source" concept and partial coherence 3=21530
 elastic constants, rods 3=6776
 filter, rotating, three-step, variable 3=16756
 fluorometer, for lifetimes, 10^{-8} – 10^{-9} sec, by modulated light 3=5514
 focometer, accuracy rel. to parameters 3=9585
 image reducer—immersed detector system for i.r. 3=7314
 lever gauge, for thickness meas. 3=14085
 micrometer eyepiece, coincidence split image 3=18971
 mirror system selecting field of view 3=16745
 modulator, using microwave ferrimag. resonance 3=14325
 nephelometer 3=6963
 photoelectric image-sharpness meas. 3=11901
 production of components, new techniques 3=16748
 quarter-wave plate, composite, theory 3=9627
 retardation plate for polarized light 3=14579

Optical instruments — contd

- rocket tracking systems 3=18666
- Ronchi ruling, angular meas. 3=9583
- shutter for square-wave exposures for vision expts. 3=14326
- spectral comparator image inverter 3=24021
- spot light image rotating in circle, device 3=18970
- stray light meas., theory and expt. 3=9581
- television, optimum viewing conditions 3=7312
- tests, Hartmann combined with spot diaphragm 3=11489
- theodolite, sighting precision 3=18973
- u.v., progress review 3=9187
- u.v. radiation detector 3=18974
- use of variable retardation plate 3=21571
- vacuum u.v. radiation of mag. compressed plasma 3=7505

Optical materials

See also Filters, optical.

- crystals, i.r. and Raman processes, theory 3=23061
- infrared, 15, refl. and transmission 2-50 μ 3=16749
- infrared, refl. and transmission, bibliography 3=16750
- i.r. radiation absorption, bibliography 3=9652
- Intran-1, absorption, compared with MgF₂ 3=20480
- Jena glasses, elastic constants, temp. var. 3=5058
- solids, nonlinear props., energy considerations 3=13155
- PbMoO₄, possibility, i.r. 3=20479

Optical pumping

- atom-wall collision study 3=17537
- atomic energy level displacement by light 3=17539
- atomic spin relax., in gas phase and on surface, comparison 3=17538
- atoms inside Fabry-Perot interferometer 3=7352
- atoms, optically oriented, mag. rotatory power 3=4714
- crystals, second harmonic generation 3=25429
- cycle, quantum theory, experimental verification of new predicted effects 3=10464-5
- disorientation cross-sections, Rb 3=8200
- 4-level system 3=22490
- inert-gas masers, mechanism 3=22005
- laser mode interaction with atoms 3=12361
- laser, sun-powered, with condenser 3=21534
- particle system with 3 energy levels 3=17070
- plasma with population inversion, tensor dielec. suscept. 3=8202
- power systems, theoretical efficiency 3=7733
- α -quartz, optical phonons, quantum electronics 3=9966
- radiation transfer by elliptical cyl. reflectors 3=14332
- ruby, cooling effect, application 3=15660
- ruby laser, by exploding wires 3=22011
- ruby laser, by short arc, high pres. Hg lamp 3=14800
- ruby, level pop. inversion rel. to cross-relax. 3=9983
- ruby, stimulated emission (4-300°K) 3=2143
- three-level systems, one and two-photon transitions 3=9967
- Cs lamp 3=16761
- He³ gas, and nuclear polarization 3=12523
- He³, 2%₂, and polarized He³ target prod. 3=15050
- K⁴⁰ detection, by optical alignment 3=15296
- KBr, strained, pure or Tl doped, by i.r. 3=18054
- KCl, strained, pure or Tl doped, by i.r. 3=18054
- KH₂PO₄, optical harmonic generation 3=20453
- KI, strained, pure or Tl doped, by i.r. 3=18054
- NH₄H₂PO₄, optical harmonic generation 3=20453
- Na vapour, thermal electron scatt., limit 3=12771
- Rb alignment, isotopic temp. var. 3=15295
- Rb vapour, as frequency standard 3=13991
- Xe, Doppler broadening and atomic temp. 3=22493
- Xe lamps used, characteristics 3=21532

Optical rotation

See also Magneto-optical effects; Optical constants; Polarimeters; Polarized light.

- absorbing plate, isotropic, passage of light 3=16788
- crystals, biaxial, interference ambiguity removal with monochromator 3=3897
- dispersion, effect of paramag. enhanced singlet-triplet transitions 3=19971
- dosimeter for Co⁶⁰ γ -facilities 3=19799
- at ferrimagnetic resonance, in YFe garnet 3=6644
- gases and molecular crystals, rel. to resonance fluorescence 3=14219
- gyroelectric media, plane-wave propag. 3=3896
- meas., solutions, highly-scatt. 3=16807

Optical rotation — contd

- middle-group crystals, planar classes activity meas. 3=20447
- polymers, effect of chain length 3=10916
- polypeptides, helical, Cotton effect, origin 3=2681
- racemates and optical antipodes, rel. to irradiation 3=10920
- singlet-triplet transitions in magnetic rotation spectra 3=2594
- transition metal compounds, ligand field approx. 3=23046
- CO₂, aq. soln., effect of circularly polarized light 3=1688
- Co(ethylenediamine)₃³⁺ ion, rotatory dispersion 3=730
- Co³⁺, ¹T_{1g} state 3=8271
- Cr³⁺, ⁴T_{2g} state 3=8271
- CrBr₃, magnetic 3=919
- InAs, i.r., effective electron mass, 293-603°K, n-type 3=20333

Optical systems

See also Aberrations, optical; Lenses; Optical images; Optical instruments; Optical materials; Resolving power, optics.

- Abbe resolution limit, exceeding 3=14322
- aberration coeffs. of higher orders 3=16734
- aberration corrections, optimum 3=14318
- for acoustic field representation 3=18908
- alignment, ang., by elastic deform., to 0.01" 3=21523
- breakdown of one-to-one correspondence bet. image and object 3=1798
- bubble chamber, (liquid H₂), for photographic tracking 3=4300
- centred system, skew ray, sine reln. 3=239
- concentric, perfect, calc. 3=11893
- contrast transmission function, meas. using gratings 3=968
- concentric, spherical aberr. theory 3=14813
- condenser for sun-powered laser 3=21534
- contrast transfer functions, computer calc. 3=11891
- contrast transmission function, effect of aberrations 3=7308
- contrast transmission function meas. by polarized light interference 3=21522
- coronagraph, 200/3000/4000 3=11490
- decentration and centring state defin. 3=16740
- design and evaluation, by modulation transfer function targets 3=18968
- design, role of optical transfer function 3=16732
- design without ray tracing, analysis from spot diagrams 3=14309
- determinant, basic 3=3864
- dielectric rod focuser 3=18967
- distortion, radial, objective, meas., Moire fringe 3=21580
- "effective source" concept and partial coherence 3=21530
- fibre optics, development and application 3=241
- fine correction, use of differential method 3=14318
- focal length meas. using auxiliary system 3=1802
- for spark chamber, in mag. field, stereo 3=17149
- frequency response techniques appl. 3=16743
- Gaussian optics, matrix calc. 3=240
- glass fibre use in point target autocollimator 3=11898
- with gratings in the pupil, transfer function 3=11892
- high numerical aperture, obeying sine condition, transfer functions 3=5512
- image position meas. by polarimetry 3=21572
- incoherent light, non-negative signals transmission 3=3892
- incoherent Sparrow resolution limit, increase by apodization 3=5511
- interference, simple, for use in microscopy 3=3887
- i.r. immersion lenses, gain calc. 3=16736
- i.r., temperature image, theory and structure 3=1864
- light pipe for large-area scintillator 3=11896
- line scanning, one- and two-dimensional 3=11894
- magnification beyond Rayleigh's limit 3=14315-16
- magnification derivative 3=24008
- maser, optical, gaseous, external concave mirrors 3=7318
- modulation transfer meas., test objects 3=18966
- for monochromators, anastigmatic, for arc imaging 3=11920
- multi-lens, Gaussian optics design 3=16738
- object in wave field, optical properties 3=7304
- objective doublet, aplanatic, insensitive to centring 3=18583

Optical systems —contd

- optical fibre, circular, light collecting props. 3=5513
- power limiter, using nonlinear crystal props. 3=7319
- quasi-invariants in ray tracing, applications 3=1801
- range finder systems, performance prediction 3=18773
- refracting system for u.v. spectrum 3=16741
- selection of field of view, mirror system 3=16745
- self-luminous objects, shadowgraph 3=9579
- spark chamber viewing, for magnet economy 3=17147
- stray light meas., theory and expt. 3=9581
- symmetrical, brightness coma and diaphragm coma 3=7307
- telescopes, Kitt Peak, auxiliary systems 3=9143
- test objects, variable transmittance, sinusoidal, prod. 3=18966
- tracking, reticles, a.m. and f.m., comparison 3=18965
- transfer function, from lens-design data 3=11888
- transfer function, measurement 3=11889

Optics

See also Aberrations, optical; Atmospheric optics; Lenses; Mirrors, etc.; Optical images.

- Alfred Kastler, C.E.K. Mees Medalist, 1962 3=16477
- cloud chamber for meas. of aerosols 3=9584
- coherence time and bandwidth measures 3=233
- conference on instruments and techniques, London (1961) 3=14308
- correlation experiments, linear and quadratic 3=21512
- correlation expts., coincidence counting technique appls. 3=21511
- crystal, low-temp., included in conference, Kiev, Oct. 1961 3=24124
- difference freq. obs., laser and lamp, in KDP crystal 3=18955
- Graham, Edgar D. Tillyer medalist 3=21184
- harmonic generation, continuous, using laser, gas 3=21506
- harmonic generation, continuous, using maser, gas 3=21507
- harmonic prod. on reflection from piezoelectric crystals, obs., GaAs, Te 3=18956
- incoherent radiation, mutual coherence 3=9574
- nonlinear media, light waves at boundary 3=231
- nonlinear processes in semiconductors and insulators 3=927
- observation of transparent isotropic objects 3=3872
- optical storage and retrieval of information 3=11910-11
- response data, vector analysis application 3=16723
- and spectroscopy, Conference, Jena 1960 3=11875
- Vavilov's work 3=16479
- Vavilov's work 3=16480

geometrical

- aberrations 3=257
- caustic locus of primary rainbow 3=9577
- centreing, mounting error effect 3=11885
- Gaussian, matrix calc. 3=240
- Huyghen's principle, relationships with, isotropic medium 3=16496
- object in wave field, optical properties 3=7304
- plane-parallel layers, nonlinear theory 3=16787
- Sommerfeld-Runge law in 3 and 4 dimensions 3=21
- tandem principle appl. to lenses for photocopying 3=11958
- wavefront reconstruction technique 3=11895

Orbital calculation methods

- alternant mol. orbital method (AMO); closed-shell struct., many-parameter energy expression 3=2602
- alternant MO approximation, correlation effects 3=19966
- alternant MO, generalization to states with different multiplicities 3=8242
- analytic wave-functions, inclusion of correlation 3=6345
- approx. radial functions for first-row transition-metal atoms 3=10435
- atomic orbital configuration wavefunctions for small molecules 3=12806
- atomic polarizabilities 3=22483
- atomic screening consts. from SCF functions 3=17521
- atoms and mols., electron correl. problem 3=12743
- atoms, two-electron, quasi-stationary states 3=2554
- benzene, multi-centre pi-electron integrals 3=12847
- benzene, spin-spin interaction, correction 3=8290
- bond orders, Hall's method, generalization 3=10496
- centrifugal distortion effects in asymm. rotator 3=2595
- chain mols., HMO calc., exact solns. of secular eqns. 3=25157

Orbital calculation methods —contd

- complex configs., electrostatic interact 3=12746
- conformational stability, for degenerate states 3=19955
- conformational stability, for nondegenerate states 3=19956
- conjugated systems, bond order matrix 3=8237
- correlation effects in two and three-electron systems 3=19922
- correl. of electrons in same shell, exchange polarization, in-out effect 3=8175
- d⁵ configuration, spin-orbit matrices 3=2545
- d-electron systems, weak-field coupling 3=22526
- diatomic homonuclear mols., forces operative 3=25079
- diatomic, multi-configurations calc. 3=15318
- Dirac and Schröd. eqns. for Coulomb potential 3=16525
- electrostatic calc., two and three-centre integrals 3=6374
- energy levels of particle in screened Debye field 3=18732
- Fermi surfaces in form of net 3=12943
- fluorescein, spectra, by LCAO MO method 3=2647
- four-electron, generalized product functions 3=10449
- free-free transitions of electron in ion field 3=22497
- g-tensor, gauge-invariant theory 3=6384
- Gaussian functions in wavefunction calc. for small molecules 3=19964-5
- Hamiltonian, rigid asymm. rotator-type, trace formulae 3=14029
- Hartree-Fock approx., perturb. method 3=3754
- Hartree-Fock functions with limited basis 3=8239
- heteroatom radicals, SCF calc. of spin-density distrib. 3=10530
- hydrocarbon, conjugated, π orbital, doubly occupied, correl. energy 3=22576
- hydrogenlike radial functions, orthogonality 3=6341
- Hylleraas expansions, half-integral 3=12750
- independent-particle model, self-consistent field theory 3=6340
- ligand field theory, spin-orbit coupling 3=25161
- limits of error at arbitrary point in theory 3=10436
- many-electron theory of atoms and molecules, effect of correlation on orbitals 3=12744
- matrix components of Hamiltonian w.r.t. correl. wave functions 3=6344
- maximum overlap method, comparison 3=10497
- molecular, new method, esp. for cyclic systems 3=2601
- molecular wave-functions, new approx. method 3=2603
- molecules, diamagnetic, Faraday effect, theory 3=6383
- molecules, lower bound for energy levels 3=25084
- molecules, transition probabs. calc. 3=12803
- molecules, zero-point energies, perturb. methods 3=12795
- $n \rightarrow \pi^*$ transitions, comparison of exciton and MO calc. 3=12804
- one-centre integrals, computer programmes 3=8225
- one-centre integrals of extraordinary functions 3=6339
- orthogonal many-electron group orbitals 3=6338
- orthogonal, rel. to generalized Wannier functions 3=6452
- permutation groups for molecular integrals, tables 3=22525
- perturbation theory, chemical bonds theory 3=1614
- Poisson transform, of
- $$\sum_{j=1}^N F(\cos 2\pi j/N) \cos 2\pi jn/N$$
 3=21196
- polarizabilities and Sternheimer shielding factors 3=17518
- quantum theory, polycentric integrals eval. 3=8221
- rotor mol. of orthorhombic symm., fourth-order Hamiltonian 3=25083
- Schrödinger H atom in n-dimensions 3=7105
- self-consistent-field theory, general treatment 3=17563
- semiempirical one-centre Coulomb repulsion integrals 3=17560
- single-centre expansion method 3=22554
- single-determinant wavefunctions, spin-component analysis 3=23785
- Slater atomic orbitals, cal. of 2-centre integrals 3=22532
- spin-spin coupling across several bonds 3=719
- spin-spin coupling const., geminal, hyperconjugation effect 3=22520
- split p-orbital, Dewar's method, evaluation 3=17561
- split-p-orbital method, difficulties 3=8238
- Thomas-Fermi theory, classical approx. 3=697

Orbital calculation methods — contd

- transition metal cyano complexes, overlap integrals 3=10529
- two-centre Coulomb potl. approx. 3=22610
- two-centre integrals over solid spherical harmonics 3=19967
- two-centre one-electron integrals 3=12792
- valence bond wave-functions, population analysis 3=6375
- varying orbital exponents in MO theory 3=4738
- zincblende lattice, orthog. plane wave method 3=10625
- AB₃ mols., MO-LCAO approx., Walsh rules 3=22519
- XH_n mols., one centre expansion method 3=6386
- H atom, nonrelativistic Schrödinger eqn., boundary conditions 3=10444
- H₂ ring, in MO and alternant MO approx. 3=8243
- KNiF₃, covalency, LCAO—MO model 3=12893
- KNiF₃, optical and mag. props. 3=933

Organic compounds

See also Plastics; Polymers; Waxes.

- absorptn., phosphorescence, of 35 cpds. 3=958
- acenaphthene, molecules, vibration symmetry types 3=17605
- acenaphthene-ion, e.s.r., h.f.s. hyperconjugation mechanism 3=22591
- acetaldehyde, molec. J-coupling and internal motion 3=737
- acetaldehyde, n.m.r., J coupling theory 3=14790
- acetic acid in very dilute solutions, dielectric polarizations 3=21394
- acetone, double refraction in strong shock waves 3=7205
- acetone, flash photolysis. 3=25835
- acetone mols., excitation modulation spectroscopy 3=12802
- acetone, saturated, vapour pressure meas. apparatus 3=19071
- acetone, solns. in various solvents, dielec. props., structure 3=21386
- acetone, u.s. wave diffraction, angular width 3=21356
- acetonitrile, elec. discharge, spectrographic study 3=12846
- acetonitrile-d₃, microwave spectrum 3=6408
- acetonitrile, i.r. absorpt., temp. depend. 3=8286
- acetophenone, phosphorescence, stimulated 3=2610
- acetylene acid, and D-substitution product, electro-optical parameters 3=15366
- acetylene-air flame with high-freq. torch, temp. meas. 3=3913
- acetylene, chemi-ionization by O atoms 3=16904
- acetylene, compared with isoelectronic molecule N₂ 3=12837
- acetylene, decomposition flame, reaction mechanism 3=25827
- acetylene flame; added Na and Sr concentration and temperature calc. 3=3393
- acetylene, flame study, dissociation and ionization processes 3=23542
- acetylene, flame study, reaction zone excitation 3=23543
- acetylene formation in liq. hydrocarbon arcs, rel. to temp. detm. 3=7484
- acetylene-d₁, i.r. spectrum, 1900-3400 cm⁻¹ 3=2637
- acetylene, ionization, by protons, 2.25 MeV 3=20024
- acetylene mol., rot-vib. consts. 3=10531
- acetylene, mol. structure det. from moments of inertia 3=2597
- acetylene, Raman spectra and mol. collisions 3=7247
- acetyl-L-glutamic acid, γ -irrad., e.s.r. 3=3164
- acoustic properties, liquid-polycrystal transition region 3=21355
- acridone solns., absorption and luminescence, rel. to association 3=141
- acrylonitrile, polymerization, effect of ionising radiations 3=6925
- adenosine-5'-phosphate, crystal structure 3=8871
- alcohol vapours, ionization potls. meas. 3=7745
- alcohol-water soln., NdCl₃ absorption spectra, -87°C 3=1691
- alcohols, compressibility and shear viscosity, temp. depend. 3=21309
- alcohols, dielectric relaxation, rel. to viscosity 3=21398
- alcohols, polyvinyl, containing dyes, luminescence 3=7213
- n-alcohols, Rayleigh line-width, orientational relax. times 3=21366
- alcohols, ten, Raman spectra, depolarization 3=22579
- alcohols, ten, Raman spectra, solvent effects 3=25115
- alcohols, tertiary, intermolec. association, rel. to dielectric polarization 3=21396
- alcohols, twelve, Raman spectra 3=22578
- aliphatic liquids, electron diffraction examination 3=21305
- aliphatic primary alcohol-CS₂ binary system, miscibility gaps 3=23875
- alkanes, heats of mixing, congruence, validity 3=23535
- alkyl ammonium salts in solution, n.m.r. unusual spin-spin couplings 3=21410
- alkyl bromides, Rayleigh line-width, orientational relax. times 3=21366
- N-alkyldithiocarbamate complexes with metals, i.r. spectra, normal coordinate analysis 3=25120
- allene, Urey-Bradley force field 3=20004
- amine-chloranil complexes, absorption spectra 3=1694
- amino acids, γ -irradiated, e.s.r. spectra, temp. depend. 3=20019
- amino-acids, interaction with riboflavin 3=8954
- 3-aminophthalimide, luminescence, active and nonactive absorption separation 3=18822
- n-amyl acetate, viscoelectric effect 3=18808
- n-amylamine, dipole moment and mol. polariz. 3=2638
- aniline, C¹³ nuclear magnetic resonance 3=10544
- aniline hydrobromide, twinning structure 3=3259
- aniline hydrobromide, u.v. pleochroism 3=4965
- aniline hydroiodide, u.v. pleochroism 3=4965
- anilines, para-substituted, C-N stretching freqs. 3=2639
- anils, thermochromy, time constants 3=20979
- anisaldazine, liquid crystal, dielec. const. 3=11803
- anthracene, α -particle scintillation 3=18045
- anthracene, C-H bond, planar bending, anomalous, -180 to 20°C 3=22577
- anthracene coal, mag. susceptibility 3=11023
- anthracene crystals, electroluminescence 3=18051
- anthracene crystals, energy migration bet. impurity mols. 3=2691
- anthracene crystals, luminescence 3=20533
- anthracene, dark currents, temp. depend. 3=15584
- anthracene, dil. solutions, Kramers-Kronig relation 3=16627
- anthracene, e.s.r., Bloch eqns. 3=6744
- anthracene, with electrolyte contact, photoelectrolysis 3=23549
- anthracene, excess defect electrons, density of states 3=4844
- anthracene, exciton-exciton interactions and photoconductivity 3=8568
- anthracene, fluorescence, double photon excitation 3=18040
- anthracene, free-carrier generation via exciton-exciton interactions 3=10887
- anthracene, luminescence 3=6628
- anthracene, luminescence decay law 3=8626
- anthracene, luminescence excited by α , p, e, decay law 3=11005
- anthracene, luminescence, two-photon, laser excitation 3=11002
- anthracene, anthracene-d₁₀, molecular vibrs., in plane, calc. 3=22580
- anthracene, negative ion soln., e.s.r. 3=6744
- anthracene, photocond. and spectral absorpt. 3=2970
- anthracene, photoconductivity, X-ray and u.v. 3=6628
- anthracene, photodepolarization, nonlinear 3=20399
- anthracene, photodepolarization, polarity, in fundamental absorpt. band 3=17908
- anthracene, sensitized photoconductivity 3=13129
- anthracene, sol. in CCl₄, molecular rotation 3=13143
- anthracene, solutions, delayed fluorescence 3=142
- anthracene, solutions, spectra, changes on addition of ferric acetylacetonate 3=15359
- anthracene, triplet excitons and delayed fluorescence 3=18041
- anthracene, X-ray diffrn. patterns 3=20859-60
- anthraquinones, substituted, crystal structure 3=23462
- anthrols, electronic spectra and H bonding 3=8287
- aromatic aldehydes, luminescence 3=961
- aromatic anion radicals, nitrosubstituted, e.s.r., hyperfine splittings 3=22593

Organic compounds — contd

- aromatic free-radical solutions, nuclear-electron spin relax. and Overhauser polarization 3=23909
 aromatic, free radicals, electronic relaxation 3=14183
 aromatic free radicals, unpaired-electron coupling with nuclear motion 3=8309
 aromatic halide scintillator solns., quenching 3=1699
 aromatic hydrocarbons dissolved in plastics, luminescence 3=7213
 aromatic hydrocarbons, Raman molecular spectra, effect of adsorption 3=8932
 aromatic ketones, luminescence 3=961
 aromatic liquids, with methoxy groups, dielec. props., 2.2 mm. 20-80°C 3=21389
 aromatic mols., dipole moments det. 3=2605
 aromatic mols., in triplet state, e.s.r. line shape, $\Delta m = 2$ transition 3=25135
 aromatic molecules, deactivation rel. to phosphorescence 3=11799
 aromatic molecules, phosphorescence, stimulated 3=2610
 aromatic, polycyclic, luminescence, two-photon, laser excitation 3=11002
 aromatic-CCl₄ complex formation 3=25814
 aromatics, irradiated, e.s.r. 3=15372
 arylsulphenyl radicals, e.s.r., g-value anisotropy 3=25137
 asphaltene, solns., electron-proton double resonance 3=7221
 associated liquids, dielec. and mechanical relaxation 3=21390
 automatic zone refiner 3=8809
 azobenzene, freezing nucleus, by u.s. velo. anomalous increase 3=18251
 azobenzene, π -electronic u.v. spectra 3=25133
 p-azoxyanisole, liquid crystals, structure rel. to u.s. waves 3=18798
 azoxybenzene, π -electronic u.v. spectra 3=25133
 p-azoxybenzoate, liquid crystal, smectic, drop and rod growth 3=21313
 p-azoxyphenetol, liquid crystals, structure rel. to u.s. waves 3=18798
 azulene anion, e.s.r. spectrum, erratum 3=8310
 benzalaniline, π -electronic u.v. spectra 3=25133
 benzaldehyde, phosphorescence, stimulated 3=2610
 1,2-benzanthracene, n.m.r., high-resolution 3=17614
 1,2-benzanthracene derivs., "excimer" fluorescence 3=21383
 benzene, adsorbed on graphite, thermodynamic functions, calc. 3=18398
 benzene, adsorption on charact. silicas 3=1382
 benzene, Cherenkov radiation by γ rays 3=2239
 benzene, compressibility, temp. depend., X-ray study 3=21322
 benzene, cryst., low-temp. luminescence 3=11003
 benzene, crystalline, exciton-phonon interaction 3=10586
 benzene, crystalline, films, i.r. spectrum 3=13191
 benzene, crystalline, triplet exciton interactions 3=25492
 benzene, C¹³ n.m.r. 3=22601
 benzene, Debye approx. 3=15440
 benzene, density, near critical point 3=21323
 benzene and derivatives, free radicals prod. by irradiation 3=2670
 benzene derivatives, luminescence 3=21380
 benzene and derivatives, phosphorescent, e.s.r. 3=21417
 benzene, electronic spin-spin interaction, correction 3=829
 benzene, i.r. absorption, pressure influence 3=25116
 benzene, isotopically substituted, zero-point energy 3=12794
 benzene, light scattering const. 3=7208
 benzene, multi-centre pi-electron integrals 3=12847
 benzene, n.m.r., p, in paramag. C, diffusion effects 3=21406
 benzene, nuclear spin-lattice relax. meas. 3=23912
 benzene, pi-electron sextet, AMO analysis 3=2602
 benzene, proton spin lattice relax. time, -1.3-80°C, 28Mc/s 3=11809
 benzene, Raman and electronic abs. spectra 3=15319
 benzene, refined AMO treatment of ground state 3=12846
 benzene, ring distortion 3=2640
 benzene scintillator, neutron detect. efficiency 3=2278

Organic compounds — contd

- benzene, sol. in CCl₄, molecular rotation 3=14143
 benzene, thermal ionization in flames, 1100°-1700°K 3=5623
 benzene, triplet state 3=16630
 benzene, vapour and solid, absorption spectra 3=20493
 benzene, vibronic-spin-orbit perturbations and assignment of lowest triplet state 3=8289
 benzene-chloroform-hexanol-1 mixtures, dielec. saturation 3=23895
 benzene-deutero benzene mixed crystals, i.r. absorption spectra 3=23081
 δ -benzene hexachloride, bond angles, nucl. quadrupole resonance study 3=8872
 benzene-methyl alcohol and benzene-dioxane mixtures, Rayleigh consts., by light scattering 3=5442
 benzene-toluene-PBD-POPOP scintillation mixture 3=4292
 benzoic acid and o-halogen derivs., i.r. spectra 3=733
 benzonitrile, structural detm. by microwave spectra 3=2640
 benzophenone, phosphorescence, stimulated 3=2610
 benzophenone solutions, stimulated light emission, -170°C 3=23886
 3,4-benzopyrene, fluoresc. extinction by ozone 3=1696
 3,4-benzopyrene, sensitized, luminescence 3=8627
 3,4-benzopyrene, delayed fluorescence 3=13212
 3,4-benzopyrene, luminescence, two-photon, laser excitation 3=11002
 3,4-benzotetraphene, delayed fluorescence 3=13212
 biacetyl, energy-transfer studies by spectrophotofluorometric method 3=23890
 biacetyl, luminescence, in cyclohexane solution, benzene sensitization, by triplet-triplet transfer 3=18820
 biacetyl, phosphorescence quantum yield, fluid and rigid solns, radiative lifetime 3=25489
 biacetyl, sensitized fluorescence in soln. 3=16631
 binary solutions, molec. scatt. power, in Raman scatt. 3=21372
 biphenyls, hydrogen yield on γ -irradiation 3=3411
 bipyridyl radical, biquaternary, spin densities 3=2654
 Bis (2,2' biphenylene)methane, electronic interactions, from e.s.r. 3=15362
 bis (cyclopentadienyl) Fe ions, n.m.r. study of electron transfer 3=12866
 bis(p-nitrophenyl) anions, intramolec. electron transfer, e.s.r. h.f.s. 3=22597
 bonds, C-H, vibrations, stretching and planar bending, -180 to 20°C 3=22577
 bonds, H, cpds. with π -electrons, effect on p.m.r. 3=15383
 bonds, H, vibration, by i.r. spectroscopy, proposed study 3=6378
 boron phthalic phosphors, phosphorescence, -183° to +160°C 3=23113
 1 bromo-2-chloroethane, far i.r. absorption 3=24031
 bromoethane and CS₂, photoionization and Lyman- α detection 3=14416
 bromoform, liquid, i.r. dispersion, 630-800 cm⁻¹ 3=18817
 α -bromonaphthalene, mol. dipole-dipole interaction, from dielectric relaxation 3=23897
 α -bromonaphthalene, phosphorescence, stimulated 3=2610
 butadiene, π -electrons, valence bond theory 3=6375
 1,3-butadiene vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 n-butane, excited, elementary processes 3=12873
 n-butane, gas-phase radiolysis 3=23550
 butane, unimolecular reactions of excited molecules 3=4786
 n-butane vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 butanediol 1,3, dielec. relax. rel. to assoc. 3=1704
 butanol, diffusion in water, trajectories, finite cell 3=18806
 butene-2, cis-trans isomerism, benzene-photosensitized 3=25828
 butene-2, cis-trans isomerization in shock tube 3=16160
 butene-2, Hg-photosensitized decomp. at low press. 3=8971
 t-butoxy radical, decomposition rel. to pressure 3=3385
 butyl acetylene, tertiary, *t*-type doubling and resonance 3=19960
 t-butyl chloride, nuclear quadrupole relaxation and its temp. dependence 3=25598
 butyronitrile, microwave spectrum 3=6409

Organic compounds — contd

- cadmium bromide dipyrindate, crystal structure 3=6854
 d-camphor, n.m.r. and spin-lattice relax., -138° to +18° C 3=20679
 camphor on quartz, epitaxy 3=20805
 carbazole donor diphenyl acceptor mixtures, e.p.r., in irradi. ether-ethanol glasses, 77°K 3=22595
 carbazole-chloranil charge transfer complex, e.s.r. 3=8708
 carbon tetrachloride, Raman and electronic abs. spectra 3=15319
 carbon tetrachloride-cyclohexane, liquid diffusion 3=7201
 carbon tetrachloride, flow anisotropy, friction const. 3=21316
 carbon tetrafluoride, γ -irradiation at low temp. 3=12874
 carbonyl, i.r. bands, splitting due to water 3=8283
 carbonyl, 3000 Å absorption, mag. dipole character and rotatory power 3=728
 carbonyl fluoride 3=6410
 carbonyl, vacuum u.v. spectrum, electronic transitions, correl. 3=22583
 carboxyl, vacuum u.v. spectrum, electronic transitions, correl. 3=22583
 casein hydrate, dielectric permittivity at hyperfrequencies 3=22988
 castor oil, luminescence, under a.c. voltage 3=16634
 cellulose, dry, conduction and electrolysis 3=20377
 cellulose, moiré fringes under X-ray microscopy 3=13578
 cetyl alcohol, n.m.r., mol. rotation 3=15958
 1:1 charge-transfer complex crystal growth of 1,4-diaminodurene in contact with p-chloranil 3=11228
 chloranil, i.r. absorptivity molar, effect of particle size 3=14346
 chloranil, nuclear quadrupole resonance 3=8743
 chlorobenzene + bromobenzene, mol. interactn. 3=296
 chlorobenzene-nitrobenzene, dielectric relaxation phenomena 3=21392
 chlorodifluoromethane, molecular consts. 3=6411
 chloroform, CHCl_3^- ions, prodn. by charge exchange 3=7444
 chloroform, Raman spectra intensities 3=20006
 chloroform, Raman spectrum rel. to change of state 3=731
 α -chloronaphthalene, mol. dipole-dipole interaction, from dielectric relaxation 3=23897
 chlorophyll a, electrical conductivity and photoconductivity 3=20401
 chlorophyll a, spectral distribution rel. to layer thickness 3=20400
 chlorophyll molecule with Mg atom in centre, polarization and fluorescence symmetry 3=2635
 chlorpromazine, conductivity rel. to phase transformations 3=10873
 chlosterol esters, liquid crystals, transparency 3=21370
 chrysene, delayed fluorescence 3=13212
 chrysene, phosphorescence at low temp. 3=13211
 cis-butene-2 vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 cis-crotonitrile, microwave spectrum, barrier to rotation, dipole moment 3=17594
 cis-, gem-, and trans-dideuteroethylenes, vapour pressures 3=8247
 cis and trans 1,2-difluoroethylene, n.m.r., gas phase 3=15385
 collidine-water solns., conc. fluctuations, light scatt. study 3=21365
 complex, viscous solns., reversible orientation dichroism 3=23881
 copper phthalocyanine, crystals, resistance, effect of halogens 3=6593
 coronene, delayed fluorescence 3=13212
 coronene, e.s.r. obs. of $\Delta m = 1$ transitions 3=1186
 crystal-violet, photoelectromotive forces 3=25418
 cumol, cracking, on Al_2O_3 or zeolites, effect of additives 3=20996
 cupric acetate monohydrate, mag. studies 3=25505
 cupric benzoate trihydrate, crystal structure 3=11273
 cyanamide, HDNCN and D_3NCN , spectra 17-57 G/c 3=10532
 cyanamide, molec. rotational consts., corrected 3=2649
 cyanamide, vibrational spectra calc. 3=4764
 cyanoacetylene, liquid, dielec. const. 3=7216

Organic compounds — contd

- cyanocarbons, thermochemistry 3=18439
 cyanogen absorpt. rel. to components of space vel. 3=7037
 cyanogen, lattice consts., space group, arrangement of mols. in unit cell 3=25729
 cyanogen, rotational analysis of 3000 Å absorpt. system 3=22582
 cyanuric and formaldehyde resins, fluorescence, on addition of aromatic ring compounds 3=15715
 cyclic cpds., ice nucleation 3=3267
 cyclobutane, isotope effects in pyrolysis 3=8961
 cyclobutanes, proton spin-spin coupling consts., relative sign 3=8296
 cycloheptatriene cycloheptatrienyl radical, e.s.r. spectrum 3=4778
 cycloheptatrienyl, e.s.r. in naphthalene crystals 3=1184
 1,3-cyclohexadiene, vapour phase photochemistry 3=11355
 cyclohexadienyl radical, e.s.r. 3=12859
 cyclohexadienyl radicals, formation by reaction of H with solid benzene 3=1388
 cyclohexane, absorption, acoustic waves, reson. 3=8352
 cyclohexane, excited, dissociation 3=25149
 cyclohexane, heat transfer, electrical conductivity and ion mobilities 3=14148
 cyclohexane, i.r. absorpt., temp. depend. 3=8286
 cyclohexane, single crystals growth 3=11229
 cyclohexane, solid, positron annihil., temp. var. 3=2774
 cyclohexyl derivatives, n.m.r. spectra 3=8297
 cyclo-octatetraene complex with Fe tricarbonyl, molec. and valence structure 3=2643
 cyclo-paraffins, luminescence 3=21380
 cyclopentane vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 cyclopropane, isotope effects in pyrolysis 3=8961
 cyclopropane, rate of decomposition 3=16158
 cyclopropanes, chlorinated, pure n.q.r. 3=25142
 cytosine monohydrate ($\text{C}_4\text{H}_5\text{N}_3\text{O}_5$), crystal structure 3=8868
 deuteromethane, liquid, viscosity 3=11762
 deuterio naphthalene in deuterio durene, triplet state e.s.r. 3=1181
 diazanaphthalene (1,4 and 1,5), e.s.r., N^{14} h.f.s. 3=8295
 diazirine, mass spectra and appearance potl. 3=24216
 diazomethane, mass spectra and appearance potl. 3=24216
 dibenzenechromium, molecular symmetry 3=729
 dibenzo-p-dioxin, radical, e.s.r., h.f.s., p and C^{13} 3=20017
 9,10-dibromoanthracene, first order triplet decay, rate consts. 3=3811
 3,5-dibromo para-amino benzoic acid, crystal structure 3=13490
 2,3-dibromopropionic acid, proton spin coupling consts. 3=736
 dibutyl phthalate, mol. dipole-dipole interaction, from dielectric relaxation 3=23897
 1,2,1,2-dichlorodifluoroethane, internal rotation isomers 3=25082
 1,2-dichloroethane, HOH n.m.r. second moment, exptl. verification of calc. 3=10538
 1,2-dichloroethane- d_2 , pure quadrupole resonance 3=8745
 2,2-dichloropropane, nuclear quadrupole relaxation and its temp. dependence 3=25598
 2,7-dichloroanthracene, e.p.r., in conc. H_2SO_4 3=20013
 diethyl ether, diffusion in NH_3 , 3=9492
 diethyl ketone- CCl_4 mixtures, photolysis 3=18455
 1,2-difluorobenzene, thermodynamic props. and vibrational assignment 3=8291
 1,1-difluoroethylene, n.m.r. in gas phase 3=8298
 difluoroethylenes, microwave spectra and structures 3=17595
 1,8-dihydroxy anthraquinone, crystal structure 3=13491
 dimethyl acetylene as moderator for cold neutron sources 3=6010
 N,N-dimethylaniline, C^{13} nuclear magnetic resonance 3=10544
 dimethyl benzene ion radicals, spin and charge densities, temp. depend. 3=25151
 2,2'-dimethyldiphenyl ether; methyl and ring protons spin-spin interaction 3=2645
 dimethyl ether, microwave spectra and structure 3=17596

Organic compounds — contd

- dimethyl ether, vac. u.v. spectrum 3=12851
 2,6 dimethylnaphthalene molecules, vibration symmetry types 3=17605
 dimethyl oxalate, critical properties 3=306
 dimethyl sulphide, torsional fine structure 3=2644
 2,7-dimethylthianthrene, e.p.r., in conc. H_2SO_4 3=20013
 dinitrobenzene anion radicals, e.s.r. linewidth alteration 3=4776
 1,4-dinitrotetramethylbenzene anion radical, e.s.r. 3=2653
 2-4-dinitrotoluene, photoisomerized, acid catal. of fading. 3=25836
 diols, with branched chains, dielec. props. 3=21397
 di-o-tolyl ether, mol. struct., by n.m.r., correction 3=10546
 dioxane addition rare earth hydrated perchlorates, crystal structure 3=20861
 diphenyl acceptor carbazole donor mixtures, e.p.r., in irradi. ether-ethanol glasses, 77°K 3=22595
 diphenyl, neutron diffusion 3=2271
 diphenylanthracene/o-xylene solns, quenching and energy transfer 3=1702
 diphenyldiazomethane in benzophenone, solid soln., e.s.r., triplet state, 77°K 3=4775
 diphenylethers, mol. struct. by n.m.r., correction 3=10546
 2,5-diphenyloxazole solns., luminescence 3=1701
 α,α -diphenyl- β -picryl hydrazine, e.s.r. absorpt. 3=15371
 2,2'-dipyridyl anion, e.s.r., h.f.s., effect of reducing agent 3=20020
 $\gamma\gamma$ -dipyridyl, e.s.r., N^{14} h.f.s. 3=8295
 discharges, electric, in vapours, Townsend, effect of space charge on current growth 3=21756
 disubstituted benzenes, high-resolution n.m.r. 3=8301
 disubstituted benzenes, proton n.m.r. 3=4779
 di-tertiary butyl peroxide, gas phase HCl-catalysed di-tetramethyl ammonium uranium hexachloride, vibrations, space-group theory calc. 3=8343
 dithiocarbamate complexes with metals, i.r. spectra, normal coordinate analysis 3=25120
 divinylamine, improved LCAO method 3=4774
 DPPH, e.s.r., g-tensor anisotropy 3=23227
 durene, green fluorescence, polarization 3=23114
 durene, naphthalene-doped, phosphoresc. 3=15712
 durene, phosphorescence at low temp. 3=13211
 dye photoconductors, e.s.r. 3=23021
 dye—polyelectrolyte complex, colour change by elec. field 3=3804
 dyes adsorbed on cellophane, absorpt. anisotropy 3=20492
 dyes adsorbed on light scattering materials, spectra 3=21515
 dyes, cationic, dark conductivity 3=25416
 dyes dissolved in polyvinyl alcohols, luminescence 3=7213
 dyes, e.s.r. spectra 3=15936
 dyes in soln., luminescence 3=11800
 dyes, in spectral sensitization of photographic materials 3=11950
 eosin, B,6G, in polymethyl methacrylate, fluorescence polarization 3=15713
 eosin, spectrum, influence of solvent mixture of MAM or ethanol 3=21378
 epoxy resin, n.m.r. of water content 3=6768
 epoxide splitting, base catalysis mechanism 3=20997
 equations of state, virial coeffs., and intermolecular forces 3=25154
 esters, adiabatic compressibility, u.s. vel. 3=11795
 esters, decomposition, criticism 3=25822
 esters, liquid, 24, absorption of acoustic waves, u.s., var. with freq. (3-20 Mc/s) and temp. 3=14159
 ethane ($\text{C}^{13}\text{C}^{12}\text{H}_6$), ν_2 + ν_6 band 3=20007
 ethane, liquid, proton spin—lattice relaxation 3=18835
 ethane, molecular parameters 3=4766
 ethane molecular, classical calc. 3=20008
 ethane, photochemistry at wavelengths below 900Å 3=13618
 ethane, photochlorination, isotope effect 3=11356
 ethane- d_6 , Raman spectrum analysis 3=4765
 ethane vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 ethanes, geminal HH coupling constants 3=8294

Organic compounds — contd

- ethanol adsorbed on Al_2O_3 surfaces, i.r. spectral study 3=3362
 ethanol, dissociation 3=12870
 ethene, isotopically substituted, zero-point energy 3=12794
 ether, compressibility, temp. depend., X-ray study 3=21322
 ether solutions of K metal and naphthalene dianion, flash photolysis 3=16180
 N-ethylacridone, triplet states study by luminescence and e.s.r. 3=962
 ethyl alcohol, dispersion at mm wavelengths rel. to dielec. props. 3=1706
 ethyl alcohol, spectrum, 20.7-31.7 kMc/s, dipole moment 3=20002
 ethyl ammonium ions, proton spectra rel to long-range N^{14} coupling 3=12864
 ethyl p-azoxybenzoate, liquid crystals, structure rel. to u.s. waves 3=18798
 ethyl p-azoxycinnamate, liquid crystals, structure rel. to u.s. waves 3=18798
 ethyl benzene, nuclear spin—lattice relax. meas. 3=23912
 ethyl benzoate, mol. dipole—dipole interaction, from dielectric relaxation 3=23897
 ethyl-d₃, chem. activated radicals, decomposition 3=11347
 ethyl fluoride, for i.r. spectrum, barrier to internal rotation 3=25121
 ethyl iodide, pyrolysis 3=6915
 ethyl iodide, reaction with HI 3=20978
 ethyl phosphate, n.m.r., in earth's field 3=20021
 ethyl radicals, reactions with I atoms 3=8972
 ethyl-d radicals, unimolecular decomposition 3=16154
 ethylene acid, and D-substitution product, electro-optical parameters 3=15366
 ethylene and C_2D_4 , absolute i.r. intensities of cryst. 3=6656
 ethylene diamine copper (II) nitrate, e.s.r. 3=8706
 ethylene, diffusion of Kr^{86} in dense gas 3=1720
 ethylene, electron transport, time-of-flight meas. 3=23940
 ethylene, isotopically substituted, zero-point energy 3=12794
 ethylene, photochemistry at wavelengths below 900Å 3=13618
 ethylene, potential function calc. 3=4767
 ethylene, Hg-photosensitized reaction at high temp. 3=8970
 ethylene oxide, first addition to phenol, base catalysis mechanism 3=20997
 ethylene— SF_6 , vibration energy transfer 3=6434
 ethylene vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 ethylenes, subst. n.m.r., C^{13} -H spin-spin couplings 3=10547
 ethylvinylketone, proton mag. res. spectra 3=2657
 ferric acetylacetonate, spectrum changes on addition to polyacene solutions 3=15359
 ferric acetylacetonate, zero-field energy levels 3=23228
 ferrocene derivatives, Fe^{57} Mössbauer effect 3=15425
 fluorene in biphenyl fluorene, triplet state e.s.r. 3=1181
 fluoresc., solns., mol. reson. interactions 3=7215
 fluorescence and absorption properties, relation 3=23892
 fluorescein, aq. soln., effect of light on ions 3=3809
 fluorescein, fluorescence and phosphorescence, in boric acid, different temps. 3=15714
 fluorescein, ionic forms, luminescence 3=7212
 fluorescein luminescence, active and nonactive absorption separation 3=18822
 fluorescein, spectra, by quantum chemistry 3=2647
 fluorescein, viscous solns., fluorescence 3=1697
 fluorobenzene, n.m.r., J coupling theory 3=14790
 fluorobenzene, nuclear spin—lattice relax. meas. 3=23912
 fluorobenzene, nuclear spin—rotation resonance 3=6421
 2-fluorobenzotrifluorides, J_{FF} in CF_3 group 3=25143
 fluorocarbons, F coupling consts., relative signs 3=15377
 fluoroform, vibr. states, pure rotational anomalies 3=2646
 fluoro-organic, F^{19} labelling by $\text{F}^{19}(\text{n},2\text{n})$ reaction 3=6828
 fluoro-organic cpds., $\text{F}^{19}(\text{n},2\text{n})\text{F}^{18}$, F^{18} retention 3=5171
 fluoroprene, 8-35 kMc/s spectrum 3=2641
 formaldehyde, $2\lambda_1$ -O band analysis 3=12852
 formaldehyde, (6.3) rotational spectrum 3=25122

Organic compounds — contd

- formaldehyde, 3000 Å absorption, mag. dipole character and rotatory power 3=728
 formaldehyde, u.h.f. spectrum, rotational transitions and centrifugal distortion 3=25124
 formaldoxime, structure 3=17598
 formamide, structure and force consts., calc. 3=2648
 formate dihydrates, monoclinic, crystal structure 3=25730
 formic acid, dipole moment 3=6412
 formic acid, Raman spectrum rel. to change of state 3=731
 formic acid, vibration frequency, rel. to H-H intermolec. bonds 3=25152
 free radical solutions, Overhauser effect and relaxation in weak fields 3=23910
 Freon, orthopositronium lifetime 3=2252
 furan, high-resolution n.m.r. 3=8301
 furan, semiempirical SCF-LCAO-MO treatment 3=17599
 furan, u.s. dispersion, molecular structure 3=21354
 gases, breakdown, electric, mechanism, effect of coeff. of secondary ionization 3=21756
 gelatine, blasting, heat and rate of combustion 3=3394
 "globular", solid-state transitions, neutron scattering 3=13393
 glycerine containing H₂O or gelatine, dielectric const., 100 Mc/s-15 Gc/s 3=21391
 glycerine-paraffin oil, dielec. props. rel. to ultrasound 3=9471
 glycerine, spark excitation temp. 3=381
 glycerine, viscosity, reduction at high shear stress 3=9422
 glycerol, dielec. relax. rel. to assoc. 3=1704
 glycerol, glassy and crystalline, proton mag. spin relaxation 3=23250
 glycine, e.s.r., γ or X-irrad., h.f.s., temp. var. 3=18132
 glycine sulphate, domain wall, dislocation catching 3=6618
 glycyglycine HCl, irradiated crystal, e.s.r. 3=15942
 guanadine Al sulphate hexahydrate, Cr³⁺ absorption spectrum 3=936
 guanidine Al sulphate hexahydrate, dielectric const., up to 23 kMc/s 3=23005
 guanidine aluminium sulphate hexahydrate reorientation of [C(NH₂)₃]⁺ 3=4941
 guanidine aluminium sulphate, piezoelectricity, inverse 3=23008
 guanidine Cr sulphate hexahydrate, polarized light absorpt., 1.7°, 4°, 20°K 3=13192
 guanidinium Al sulphate hexahydrate, e.s.r. of Fe³⁺ 3=6747
 guanidinium sulphate, ferroelec. parameters, γ -ray effects 3=17937
 guanine, dielec. props., semiconductivity 3=866
 halomethanes, reaction with Na, activation energy and number of CH and CF bonds 3=18440
 1-halonaphthalenes, external spin-orbit coupling in soln. 3=2608
 n-heptane, double refraction in strong shock waves 3=7205
 n-heptane gas stream, electron scatt. 3=15397
 n-heptane, neutron diffusion parameters 3=22143
 hexamethylbenzene, conductivity rel. to crystalline transition 3=10873
 hexamethylbenzene, phosphorescence at low temp. 3=13211
 hexamethylenetetramine, growth from vapour 3=23400
 hexamethylenimine-water solns., conc. fluctuations, light scatt. study 3=21365
 hexamethylenetetramine, Debye approx. 3=15440
 hexamethylenetetramine, electro-optical effect, advantages 3=23049
 n-hexane, electric strength 3=14180
 n-hexane, ion-molecule reactions, in radiolysis at low temps. 3=6927
 hexane, liquid, elec. cond. 3=23900
 n-hexane, liquid, electrical conductivity rel. to γ -irradiation 3=11804
 n-hexane, surface tension, effect of N₂ and Ar, 1-120 atm 3=18795
 hexanediamine, nuc. quadrupolar coupling 3=2656
 hexanetriol 1,2,6, dielec. relax. rel. to assoc. 3=1704
 n-hexanol, dielectric, orientation polarization, rel. to solvent 3=21395
 1,3,5-hexatriene, vapour phase photochemistry 3=11355

Organic compounds — contd

- holmium ethyl sulphate, zero field splitting 3=8600
 hydrazyl-type radicals in viscous media, e.s.r. 3=21418
 hydrocarbon chains, unsaturated, spin-spin coupling 3=4783
 hydrocarbon gases, ionization, by beta-rays, H isotope effect 3=19171-2
 hydrocarbon gases, stopping of protons and He ions 3=22133
 hydrocarbons, adsorpt. by metal films 3=20939
 hydrocarbons, C-H bond moment 3=15334
 hydrocarbons, effect of molecular bonding on ionization coeffs. 3=9721
 hydrocarbons, heat of wetting of Al in solution 3=16131
 hydrocarbons, mass spectra from high-energy electron impact 3=4013
 hydrocarbons, 2nd virial coeffs. of mixed vapours 3=14205
 hydrocarbons, unsat., Raman and electronic abs. spectra 3=15319
 hydrocyanic acid, and D-substitution product, electro-optical parameters 3=15366
 hydroxy-benzenes, proton chem. shifts and π -electron distrib. 3=4781
 imidazol, crystal struct., atomic 3=18329
 imidazole, effect of purification on semiconducting props. 3=10826
 iodides, pyrolysis kinetics 3=16157
 indophenol, molecules, apparent asymmetry, by n.m.r. 3=20003
 iodobenzene, C¹³ nuclear magnetic resonance 3=10543
 ion radical salts, triplet spin exchange 3=11109
 ionic photoconductive dyes, charge carrier sign 3=8531
 isoamyl phthalate, mol. dipole-dipole interaction, from dielectric relaxation 3=23897
 isobutane, gas-phase radiolysis 3=8978
 isobutane, reaction with O atoms 3=11340
 isobutene, kinetics of HI addition 3=11338
 isobutyl radicals, isomerization 3=8948
 isopentane, spectral dispersion curves 3=17592
 isopropanol, i.r. spectra and H-bonding 3=12853
 isopropanol, superheated, nucleation by elec. field 3=14420
 isopropyl, n.m.r. spectra, types A^B, A^BX 3=10542
 ketene, i.r. spectrum and vibrational potential function 3=17600
 ketene and deuteroketenes, fundamental vibrational frequencies 3=12854
 ketyls, e.s.r. spectra rel. to coupling consts. and spin densities 3=4777
 labelling, catalytic tritium method 3=19800
 liquid binary mixtures, u.s. velocity 3=9455
 liquid hydrocarbon, dynamic contact angle with water between parallel plates 3=1672
 liquid pairs, coord. numbers and diffusion coeff., temp. depend. 3=21329
 liquid, ring compounds, Raman scatt., stimulated emission 3=5445
 liquid scintillators, emission spectra 3=9464
 liquids, molec. orientation distrib., Rayleigh light scatt. 3=21369
 liquids, paraffins, bromine substituted, dipole orientation relaxation 3=7207
 liquids, temp. variation of u.s. vel. and adiabatic compressibility 3=7204
 liquids, viscosity, structural data 3=21312
 malononitrile, i.r. absorption spectrum in Ar matrix 3=10527
 meta-fluorochlorobenzene, spectra, 10.5-26.3 Gc/s 3=4768
 methane, abundance in ground level air 3=13664
 methane, adsorptn. on carbon black 3=1377
 methane-d₂, analysis of two i.r. bands 3=12855
 methane boiling and triple points, detm. 3=9659
 methane and CHCl₃, photochlorination, isotope effect 3=11356
 methane, density, 20 × 10⁶ atmospheres 3=21100
 methane-D₂ mixtures, n-irrad., failure of T elastic collision model 3=18460
 methane, deuterated (CH₃D), spectrum, 400-6000 cm⁻¹ vibr., rot. 3=22587

Organic compounds — contd

- methane and deuterioforms, mass spectra, metastable transitions 3=25148
 methane, electron avalanches, carrier amplification 3=9761
 methane, electronic structure, Hartree-Fock approx. 3=10534
 methane, γ -irradiated at low temp. 3=12874
 methane, ionization by electron impact 3=1929
 methane, ionization coeffs., 9.7–52.6 mm Hg 3=24214
 methane, isotopically substituted, zero-point energy 3=12794
 methane, liquid, eqn. of state at low temp. 3=18801
 methane, liquid mixture with Ar and Kr, viscosity 3=7185
 methane, liquid, self-diffusion and impurity-controlled proton relaxation 3=7202
 methane, liq., slow neutron scatt. 3=14142
 methane, liquid, viscosity and mol. interaction 3=9423
 methane, mol. structure det. from moments of inertia 3=2597
 methane-Ne, cosmic ray muons in, energy-loss-rate 3=24821
 methane, one-centre wave functions 3=17577
 methane, photochemistry at wavelengths below 900 Å 3=13618
 methane, photo-ionization 3=3404
 methane, photolysis, by vacuum u.v. 3=25834
 methane, radiolysis 3=16182
 methane, ν_1 Raman band, rot. structure 3=22586
 methane, Raman scatt. at 15–250 atm. 3=176
 methane and methane- d_4 , Raman intensities 3=22559
 methane, Rayleigh scatt., depolarization. 3=175
 methane, refractivity, second virial coeff. 3=3835
 methane, spectra, emission, excited by protons and H atoms 3=15338
 methane, substituted, chem shift, rel. to C^{13} -H, spin-spin coupling 3=20022
 methane, turbulent wakes 3=164
 methane- d_4 , vibr.-rot. energy transfer 3=6414
 methane, $2\nu_3$ and $2\nu_4$, vibr.-rot. interact. 3=6413
 methane- d_4 , $2\nu_3$, vibr.-rot. interact. 3=6413
 methane, vibr.-rotational energy transfer 3=6414
 methane- H_2 -air flame, probe characteristics 3=4154
 methanes, geminal HH coupling consts. 3=8294
 methanol adsorbed on Al_2O_3 surfaces, i.r. spectral study 3=3362
 methanol, double refraction in strong shock waves 3=7205
 methanol, exchange between solvated cations and solvent 3=8944
 methanol, rel. to contact ion pairs of tetra-*n*-butyl ammonium iodide in CCl_4 3=13612
 methanol, superheated, nucleation by elec. field 3=14420
 methanol, surface tension, effect of Ar, 1–120 atm 3=18795
 methanol, Urey-Bradley force consts. 3=8292
 methylacetylene, i.r. spectrum, ν , band 3=4770
 methyl acetylene, I -type doubling and resonance 3=19960
 methyl alcohol, in acetonitrile, absorpt. band of O-H bond 3=8285
 methyl alcohol-air flames, OH bands 3=12830
 methyl alcohol, dispersion at mm wavelengths rel. to dielec. props. 3=1706
 methyl alcohol microwave spectrum, σ -Stark effect 3=734
 methyl alcohol, n.m.r., J coupling theory 3=14790
 methyl alcohol, Raman spectrum rel. to change of state 3=731
 methyl alcohol, solvation number of Mg^{2+} 3=1685
 methylamide, liq., thermal neutron scatt. 3=2652
 methylamine, dissolved Cs and Rb e.s.r. 3=16640
 3-methylaminophthalimide, optical props. 3=1703
 methyl ammonium alum, crystalline dimorphism 3=1342
 methyl anilines, C^{13} nuclear magnetic resonance 3=10544
 9-methylanthracene and perylene, excitation energy transfer, effect of solvent viscosity 3=23887
 methyl benzoate, nuclear spin-lattice relax. meas. 3=23912
 methyl cyanide, I -type doubling and resonance in r.f. 3=19960
 methylcyclohexane, fluorinated, spectral dispersion curves 3=17591

Organic compounds — contd

- methyldichlorosilane, n.m.r. spectrometer resolution detm. 3=19471
 methyl-N,N-dimethylaniline, C^{13} nuclear magnetic resonance 3=10544
 methylene, heat of formation 3=18438
 methylene chloride, reaction with active N_2 , quenching by CH_2Cl_2 3=11344
 methylene chloride, nuclear quadrupole relaxation and its temp. dependence 3=25598
 methylene derivs., electron spin-spin interact., bond angle effect 3=25126
 methyl ether- CCl_2F_2 and - SF_6 , vibr. energy transfer 3=6434
 methyl ether-methyl chloride, vibr. energy transfer 3=6434
 methyl ethyl ketone, superheated, nucleation by elec. field 3=14420
 methyl fluoride, Stark effect and dipole moment 3=17601
 methyl-fluoro-silane molecules, potential functions 3=20011
 methyl formamides, n.m.r., J coupling theory 3=14790
 methylgermane, i.r. spectra 3=17603
 methyl iodide, gas-phase reaction with HI 3=11339
 methyl iodide, reactions with alkali atoms 3=5160
 methyliodobenzenes, C^{13} nuclear magnetic resonance 3=10543
 methyl isothiocyanate, molal thermodynamic props., ideal gas state, 273–1000°K 3=14210
 1 and 2 methylanthralene molecules, vibration symmetry types 3=17605
 methylnitrobenzenes, C^{13} nuclear magnetic resonance 3=10545
 2-methyl pentanediol 2,4, dielec. relax. rel. to assoc. 3=1704
 methyl salicylate, n.m.r. 3=8302
 methyl siloxanes, compressibility and shear viscosity, temp. depend. 3=21309
 methylsilylacetylene, i.r. spectrum 3=4771
 methylstannanes and related cpds., proton mag. resonance 3=22602
 methyl-substit. mols., hyperconjugation, rel. to proton hyperfine splitting 3=739
 1-methylthymine, crystal structure 3=8869
 methyltrivinylsilane, proton energy levels, by nuc. mag. double resonance 3=2658
 methylvinylketone, proton mag. res. spectra 3=2657
 molec. crystals in triplet state, photocond. 3=4951-2
 molecular complex form., by electron transfer 3=21003
 molecular environment of carbonyl group, effect on i.r. intensity 3=6405
 molecule conjugated, π orbital, doubly occupied, correl. energy 3=22576
 molecules, O^{17} n.m.r. linewidths, rel. to quadrupole coupling consts. 3=22599
 monochloroacetonitrile, nuc. quadrupole coupling 3=2656
 monochlorobenzene-paraffin oil, props. rel. to ultra-sound 3=9471
 monochloroethyl and trichloromethyl radicals, recombination and disproportionation 3=8974
 monodeuteroethylene, vapour pressure, isotope effect 3=8248
 monomethyl benzene ion radicals, spin and charge densities, temp. depend. 3=25151
 monofluoroacetonitrile, microwave spectrum 3=4772
 monoisopropylidiphenyl, neutron diffusion 3=2271
 mono-olefins, analogue of $n \rightarrow \pi^*$ transitions 3=15367
 naphthalene, solutions, spectra, changes on addition of ferric acetylacetonate 3=15359
 naphthalene, as neutron detector 3=4411
 naphthalene, crystal excitons, capture by anthracene impurity, mechanism 3=20139
 naphthalene, Debye approx. 3=15440
 naphthalene, in durene, radiationless triplet-singlet transitions 3=23115
 naphthalene, e.s.r. obs. of $\Delta m = 1$ transitions 3=1186
 naphthalene, evaporation, etch-pit formation 3=3934
 naphthalene, fluoresc. spectrum, 2°–100°K 3=25493
 naphthalene, fluorescence spectrum & decay time 3=138

Organic compounds — contd

- naphthalene, freezing nucleus size, by u.s. velo. anomalous increase 3=18251
 naphthalene, hole mobility, calc. 3=20339
 naphthalene, luminescence, γ -excited, yield rel. to impurity concn. 3=963
 naphthalene mols., excitation modulation spectroscopy 3=12802
 naphthalene, molecules, vibration symmetry types 3=17605
 naphthalene negative ion, C^{13} coupling const. 3=15384
 naphthalene, phosphorescence at low temp. 3=13211
 naphthalene, photodepolarization 3=17908
 naphthalene quenching of liquid scintillation solns. 3=11801
 naphthalene, sol. in CCl_4 , molecular rotation 3=14143
 naphthalene, solid and liquid, with soluble impurities, thermal expansion near m.p. 3=21324
 naphthalene, solubility in compressed gases 3=304
 naphthalene, solutions, spectra, changes on addition of ferric acetylacetonate 3=15359
 naphthalene solvent, soln. scintillators 3=18821
 naphthalene, sublimation, heat exchange, nature 3=16841
 naphthalene, u.s. dispersion, molecular structure 3=21354
 naphthalene, u.v. spectra 3200–2200 Å, absolute intensity 3=934
 naphthalene-tetrachlorophthalic anhydride, phosphorescence and fluorescence, 2-photon excitation 3=25490
 naphthazarin, radical, anion, e.s.r. and H-bonds 3=17610
 nematic and cholesteric liquid crystals, order and flow 3=9441-2
 neopentane- C_6H_6 , neopentane- C_6H_{12} mixtures, velo., acoustic waves, var. 3=16822
 n-heptane-air mixtures, ignition 3=20991
 n-hexane, solid, radiation chemistry. 3=25838
 nitrobenzene, C^{13} nuclear magnetic resonance 3=10545
 nitrobenzene, n.m.r. 3=739
 nitrobenzol, soln. in n-heptane, optical extinction and light scatt. 3=21367
 nitrobenzol, solns. in hexane, dielec. props., structure 3=21386
 nitrogen heterocyclics, spin-orbit coupling and radiationless processes 3=17604
 nitrogen-organic cpds, $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ transition spectra in discharges 3=12850
 nitromethane, detonation 3=8962
 nitrosohydroxylaminesulphonate ion, decomposition, acid catalysed, kinetics 3=20980
 n.m.r., chemical shifts, theory 3=15375
 n.m.r. techniques, survey 3=17065
 octacyanide complexes, electronic structure and spectra 3=725
 n-octadecane, spectral dispersion curves 3=17592
 n-octadecyl disulphide, γ -irradiated, e.s.r. 3=6416
 octamethyltrisiloxane, liquid and crystalline, i.r. spectra rel. to temperature 3=14169
 n-octane, surface tension, effect of Ar, 1–120 atm 3=18795
 oil, heat transfer, transient phenomena 3=11965
 oils, NBS, for viscometer calibration 3=9421
 oils, n.m.r. of 6 types 3=23913
 oil-vapour flow in piping, low conductance 3=16647
 olefins, reactions with O atoms 3=11341
 organometallic cpds. scintillator solns., quenching 3=1700
 oxadiazoles, absorption spectra, rel. to 1-methylnaphthalene 3=18815
 oxalic acid, Al, electrolysis, luminescence, flash spectra 3=10984
 oxalyl chloride/fluoride, C^{13} satellites in n.m.r. spectra 3=15374
 oxalyl fluoride, C^{13} satellites in n.m.r. spectra 3=15374
 oxazoles, absorption spectra, rel. to 1-methylnaphthalene 3=18815
 oxygen cpd., H-bond with H halide 3=2629
 paracumul, cracking, on Al_2O_3 or zeolites, effect of additives 3=20996
 2,2'-paracyclophane, electronic spectrum 3=4773
 paradichlorobenzene, nuclear quadrupole relaxation and its temp. dependence 3=25598
 paradichlorobenzole crystals, n.q.r. signals 3=6769
 paraffin, neutron moderation 3=19648
 paraffin particles with fatty acids, amines etc., colloids prepn. 3=3417

Organic compounds — contd

- paraffin wax, electret effects meas. 3=8566
 paraffin wax, freezing nucleus size, by u.s. velo. anomalous increase 3=18251
 paraffins from C_1 to C_{10} , mass spectra, field ionized 3=14524
 paraffins, compressibility and shear viscosity, temp. depend. 3=21309
 paraffins, density, near meniscus vanishing point 3=21323
 n-paraffins in dil. solution, self-diffusion 3=16606
 paraffins, e.s.r. of Ag atoms at 77°K 3=15948
 n-paraffins, fragmentation model 3=16903
 paraffins, negative ions, by mass spectra 3=11372
 paraffins, normal, and dil. solns., molec. optical anisotropy 3=136
 n-paraffins, Rayleigh line-width, orientational relax. times 3=21366
 para-halogeno-styrene, thin films, amorphous, electron diffraction study 3=1368
 para-substituted fluorobenzenes, π -electron distrib. and F^{19} n.m.r. shielding 3=8300
 para-terphenyl, α -particle scintillation 3=18045
 π -electron crystals, rapid triplet excitn. migration 3=3058
 pentacene, bond lengths 3=1341
 pentachloroethane, far i.r. absorption 3=24031
 pentacyclic hydrocarbons, ring currents 3=10536
 pentaerythritol, effect of high press. on crystal structure 3=3252
 pentaerythritol, elastic constants 3=8749
 pentaerythritol, electro-optical effect 3=23048
 n-pentane, pool-boiling heat-transfer 3=298
 n-pentane, spectral dispersion curves 3=17592
 n-pentane vapour, u.v. absorption and ionization cross-sections, 9–25 eV 3=1932
 n-perfluoroheptane, spectral dispersion curves 3=17591
 perylene in 2,3 dimethyl naphthalene, fluorescence 3=18042
 perylene, luminescence, dispersed in n-heptane, polarization, electric field effects, 77°K 3=18043
 perylene in 2 methyl naphthalene, fluorescence 3=18042
 petrol, electromagnetophoresis 3=16901
 phenanthrene in biphenyl & fluorene, triplet state e.s.r. 3=1181
 phenanthrene, optical properties, in exciton absorption band region 3=20494
 phenanthrene, phosphorescence at low temp. 3=13211
 phenanthrene, photodepolarization, polarity, in fundamental absorpt. band 3=17908
 phenanthrene, from photolysis of cis-stilbene 3=23551
 phenanthrene, polarization of luminescence 3=3062
 phenanthrene, solutions, delayed fluorescence 3=142
 phenol, first addition of ethylene oxide, base catalysis mechanism 3=20997
 phenol-formaldehyde resins, improved thermal and dielectric props., by addition of quartz 3=8544
 phenol, freezing, nucleus size, by u.s. velo. anomalous increase 3=18251
 phenopolyurethane, absorption, acoustic waves, wedges 3=16717
 phenoxy radical in nitrogen matrix, photolysis, 4.2°K 3=3403
 phenyl acetate, nuclear spin-lattice relax. meas. 3=23912
 phenylacetylenes, intensities of $C\equiv C$ and $C-H$ bands 3=10537
 phenylcyclohexane scintillator, neutron detect. efficiency 3=2278
 phosphors, activated with fluorescein, tryptaflavine, auramine, α -phosphorescence 3=3063
 phosphors, triplet states, e.s.r. invest. 3=5035
 photoconductivity of polymer films 1μ thick 3=25420
 phthalic acid, in alums, phosphorescence, -183° to +125°C 3=23116
 phthalic acid, powder, reflection spectra, rel. to phthalimide cpds., limiting polarization rel. to electronic transition frequency 3=2635
 phthalimide derivatives, dipole moments in first excited singlet state 3=20010
 phthalimide derivs., first and second excited states 3=4739
 phthalocyanine, carrier transport, applicability of band model 3=22680
 phthalocyanine, conductivity rel. to phase transformations 3=10873

Organic compounds — contd

- phthalocyanine crystals, photoconductivity 3=23019
 phthalocyanine crystals, spectra, absorpt., polarization 3=20495-6
 phthalocyanine dyes, e.p.r., impurity $g = 2$ lines 3=20653
 phthalocyanine, metal-free crystals, bulk currents 3=8528
 phthalocyanine, optical absorption of metal-free crystals 3=10971
 phthalocyanine, photoconductivity of metal-free crystals 3=10890
 phthalocyanine with uranyl complex, luminescence 3=20534
 phthalocyanines, absorption spectra 3=18013
 phthalocyanines, rectification props. 3=17916
 4-picoline, nuc. quadrupolar coupling 3=2656
 β -picoline-water solns., conc. fluctuations, light scatt. study 3=21365
 porphyrin charge-transfer complexes with sym-trinitrobenzene 3=2651
 porphyrin cpds., limiting polarization rel. to electronic transition frequency 3=2635
 porphyrins, fluorescence polarization 3=2650
 porphyrins, luminescence 3=9467
 porphyrins, spectroscopy 3=25129
 propane, breakdown, between plane electrodes, rel. to press. 3=4091
 propane- d_8 , radiolysis 3=18457
 propane, radiolysis, inhibition of Ar-sensitizing by H 3=8977
 propane, radiolysis, rare-gas sensitized 3=3409
 1- C^{13} -propane, reaction with H atoms 3=20989
 propane, reactions with $Hg(^{199}P)$, D isotope effect 3=8973
 propane vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 propane- O_2 - N_2 mixtures, speed of detonation 3=3395
 1-propanol-2-methylpentane, dielec. relaxation 3=23898
 n-propyl, of Cd, Sn, Hg, Pb, n.m.r., 25 Mc/s satellite line analysis 3=22598
 n-propyl chloride, microwave spectrum, 2 rotational isomers 3=25130
 propylene, incandescent reaction with Nb 3=13605
 propylene, sulphide microwave spectrum 3=20009
 propylene vapour, u.v. absorption and ionization cross-sections, 9-25 eV 3=1932
 proto naphthalene in durene and biphenyl, triplet state e.s.r. 3=1181
 purines, single crystals, polarized absorption spectra 3=25131
 pyracene ions, e.s.r., h.f.s., hyperconjugation mechanism 3=22591
 pyrazine, e.s.r., N^{14} h.f.s. 3=8295
 pyrazine, single-triplet transitions, role of ground state 3=8245
 pyrazine, spectrum, ground-triplet transitions and mixing 3=22588
 pyrene anion, e.s.r. spectra 3=8310
 pyrene, delayed fluorescence 3=13212
 pyrene in 2.3 and 2.6 dimethyl naphthalene, fluorescence 3=18042
 pyrene in ethanol, luminescence, delayed and normal, spectra 3=14174
 pyrene, luminescence, two-photon, laser excitation 3=11002
 pyrene, solutions, spectra, changes on addition of ferric acetylacetonate 3=15359
 pyrene, spectra, 4000-400 cm^{-1} 3=25468
 pyridazine, single-triplet transitions, role of ground state 3=8245
 pyridine, and deuterioisomers, coordinates of planar vibrations 3=8293
 pyridine, spectrum, ground-triplet transitions and mixing 3=22588
 pyridine type mols. complexed with paramag. Ni(II) and Co(II) acetylacetonates, n.m.r. 3=25144
 pyridine, nuc. quadrupolar coupling 3=2656
 pyridine, single-triplet transitions, role of ground state 3=8245
 pyridine, u.s. dispersion, molecular structure 3=21354
 2-pyridenes, proton n.m.r., strong coupled AA'KL system 3=4780
 pyrimidines, single crystals, polarized absorption spectra 3=25131

Organic compounds — contd

- pyrocarbons, e.s.r. 3=13305
 pyrrole, improved LCAO method 3=4774
 quaterphenyl in scintillation chamber 3=4296
 quinizarin, radical, anion, e.s.r. and H-bond 3=17610
 β -quinol clathrates of N_2 , CO and CH_4 , N_2 , CO, CH_4 motion, 15-100°K 3=8284
 quinoline, u.s. dispersion, molecular structure 3=21354
 quinonemethide, molecules, apparent asymmetry, by n.m.r. 3=20003
 radicals, in liquids, spin-lattice relaxation 3=3817
 Raman spectra, crystalline powders, compared with solutions 3=6650
 rhodamine B, decoloration by pH changes 3=23536
 rhodamine dye, luminescence, active and nonactive absorption separation 3=18822
 rhodamine B, 6G, in polymethyl methacrylate, fluorescence 3=15713
 rhodamine B, spectrum, influence of solvent mixture of MAM or ethanol 3=21378
 riboflavin, absorption spectra change on addition of amino-acids 3=8954
 riboflavin, interaction with amino-acids 3=8954
 rod-like mols., sedimentation in ultracentrifuge 3=11361
 sec-butyl radicals, collisional energy transfer in rare gases 3=12878
 sec-butyl radicals, collisional energy transfer with molecules 3=12679
 sec-butyl radicals, produced by chem. activation 3=8965
 semiquinone solutions, dynamic nuclear polarization 3=23908
 semiquinones, C^{13} e.s.r. hyperfine interactions 3=22589
 silicone oil films, 350-5000 Å, insulation 3=21388
 silicone, vacuum apparatus, contaminant 3=14229
 silyl acetylene, microwave spectrum and structure 3=25132
 solutions, luminescent, for scintillators, non-radiative transfer 3=10001
 spectra, electro-optical parameter theory, H-D isotope effects 3=25114
 spectra, quasilinear, obtained at low temp. and in paraffin solid solutions 3=18012
 stearic acid adsorbed on stressed metal surfaces, birefringence 3=4962
 stearic acid, adsorption by mica, Fe, Cu, Au 3=8931
 stilbene and derivs., absorpt. and fluoresc. spectra 3=735
 stilbene, luminescence polarization, rel. to excitation-energy migration 3=11000
 stilbene, as neutron detector 3=4411
 stilbene, photodepolarization, polarity, in fundamental absorpt. band 3=17908
 stilbene, π -electronic u.v. spectra 3=25133
 stilbenequinone, molecules, apparent asymmetry, by n.m.r. 3=20003
 styrene, u.s. dispersion, molecular structure 3=21354
 substituted benzaldehyde an ions, rotational, e.s.r. study 3=15373
 sucrose crystal growth 3=8803
 tartaric acid, Al, electrolysis, luminescence, flash spectra 3=10984
 terphenyl, effect of adsorption on fluoresc. spectrum 3=8932
 terphenyl, photoelec. fluorescence props., u.v. 3=21865
 p-terphenyl solns., luminescence and spectra 3=1701
 1,1,2,2-tetrabromoethane, C^{13} n.m.r. 3=22594
 tetracene, bond lengths 3=1341
 tetrachloroethane, far i.r. absorption 3=24031
 tetracyanoquinodimethane ion radical salts, e.s.r. 3=11109
 tetracyclic hydrocarbons and alkyl-substituted derivatives, spectra and state assignments 3=15360
 tetradecanoic acid coating to suppress neutron total refl. 3=7867
 tetradeuteriomethane, absorptn. on carbon black 3=1377
 tetrahydrofuran, vac. u.v. absorption spectrum 3=15365
 tetrahydropyran, vac. u.v. absorption spectrum 3=15365
 tetramethyl ammonium chloride, irradiated crystal, e.s.r. 3=8716
 tetramethylammonium dichromate, spectrum 3=15871
 tetramethylammonium mercury tribromide $[N(CH_3)_4HgBr_3]$ crystal structure and ferroelec. props. 3=13488

Organic compounds — contd

- tetramethyl-1,3-cyclobutanedione, u.v. absorption spectrum 3=17606
- 1, 1, 4, 4-tetramethylcyclohexyl-cis-2,6 diaetate relative signs of geminal and vicinal coupling const. 3=2663
- tetramethyl-paraphenylenediamine in 2-methylpentane, u.v. irradi., e.s.r. 3=5041
- tetramethylparaphenylenediamine 2-methyl pentane, stimulated emission 3=959
- tetra-n-butyl ammonium iodide in CCl_4 , contact ion pairs, rel. to added methanol 3=13612
- n-tetranonacontane ($\text{C}_{99}\text{H}_{198}$), crystal growth and habits 3=11236
- tetraphenylbutadiene, photoelec. fluorescence props., u.v. 3=21865
- tetraphenylporphyrin with Mg and Zn, D_{4h} symmetry structure and limiting polarization 3=2635
- tetravinylsilicon, proton mag. res. spectra 3=2657
- s-tetrazine, nature of emission spectra 3=18044
- thiolacetic acid, molar thermodynamic props., ideal gas, state, 273-1000°K 3=14210
- thionaphthalene, near u.v. spectra 3=15368
- thiophene, high-resolution n.m.r. 3=8301
- thiophene, u.s. dispersion, molecular structure 3=21354
- thiourea, low-temp. ferroelectric phase, electron diffr. crystallography 3=18330
- thiourea, molar thermodynamic props., ideal gas state, 273-1000°K 3=14210
- thioxanthone S, S-dioxide, e.s.r. of mononegative ion 3=2655
- tin cpds., Sn^{119} 23.8 keV Mössbauer spectra 3=15415
- tolane, i.r. spectrum, freqn. and intensities 3=25469
- tolane, as neutron detector 3=4411
- tolane, photodepolarization, polarity, in fundamental absorpt. band 3=17908
- toluene, i.r. absorpt., temp. depend. 3=8286
- toluene, methyl and ring protons, n.m. relax. 3=4282
- toluene, nuclear spin-lattice relax. meas. 3=23912
- toluene vapour, h.f. resistance 3=9515
- trans-1-chloropropylene, microwave spectra 3=2642
- trans-stilbene, α -particle scintillation 3=18045
- transition metal cyano cpds. overlap integral calculation 3=10529
- 1, 3, 5-triaryl-2-pyrazoline, fluorescence, wavelength shifting in scintillators 3=25491
- tricyanomethanide ion, i.r. and Raman spectra 3=6407
- triethylamine-water solns., conc. fluctuations, light scatt. study 3=21365
- trifluoromethanethiol, i.r. spectrum and internal rotation 3=6401
- triglycine fluoroberyllate, elec. conductivity nr. phase-transition pt. 3=17924
- triglycine sulphate, corrosion by domain boundaries 3=8563
- triglycine sulphate, critical-pt. polarization fluctuations 3=893
- triglycine sulphate, deuterated, dielec. props. 3=13122
- triglycine sulphate, dielec. props. 100 c/s to 3 Gc/s 3=20386
- triglycine sulphate, dielec. props rel. to γ -irrad. 3=25406
- triglycine sulphate, dielectric const., up to 23 kMc/s 3=23005
- triglycine sulphate, elastic props. and internal friction 3=13323
- triglycine sulphate, electrostrictive constants 3=15624
- triglycine sulphate, far i.r. dielec. props. 3=15887
- triglycine sulphate, ferroelec. props. 3=6619
- triglycine sulphate, ferroelectric properties, rel. to γ -irradiation 3=20387
- triglycine sulphate, ferroelectric, high pressures, hysteresis 3=23004
- triglycine sulphate, ferroelectric transition temp., press. depend. 3=17938
- triglycine sulphate, inverse piezoelectric effect, various dependences 3=20391
- triglycine sulphate, permittivity increase during slow switching 3=2960
- triglycine sulphate, piezoelec. and elastic props., effect of γ -radiation 3=17949

Organic compounds — contd

- triglycine sulphate, polarization relaxation above Curie temp. 3=2961
- triglycine sulphate, pyroelectric response 3=25414
- triglycine sulphate, thermal expansion 3=6481
- triglycine sulphate, twins and dislocations, etching 3=22790
- trimethylacetic acid, n.m.r. study 3=13313
- trimethylammonium ion in aq. soln., proton-transfer study by n.m.r. 3=25812
- trimethylene oxide, vac. u.v. absorption spectrum 3=15365
- 2, 2, 4 trimethylpentane, double refraction in strong shock waves 3=7205
- s-trinitrobenzene, e.s.r., photo induced, line splitting 3=18831
- 1, 3, 5 - triphenylbenzene, e.s.r. obs. of $\Delta m = 1$ transitions 3=1186
- triphenyl derivatives of group IV elements, ring proton shifts 3=16637
- triphenylene, e.s.r. obs. of $\Delta m = 1$ transitions 3=1186
- triphenylmethane dye halides, dark conductivity 3=25416
- triphenylmethyl, absorption and fluoresc. spectra at 4.2°K 3=4976
- triphenylmethyl radical, e.s.r., spin densities, corrections 3=20018
- tris (2,2'-dipyridyl) Os ions, n.m.r. study of electron transfer 3=12866
- tris (1,10-phenanthroline) Fe ions, n.m.r. study of electron transfer 3=12866
- tryptaflavine, luminescence 3=9469
- tyrosine thermoluminescence, rel. to surf. area and gas press. 3=18052
- unsaturated hydrocarbons, d-hybridization in π molecular orbitals 3=10533
- uranin dye solns., luminescence polariz. and decay 3=23893
- uranin, soln., fluoresc. depolariz. by mol. rotation 3=139
- uranyl acetate, absorption bands analysis 3=8282
- urea ammonium bromide, crystal structure 3=13487
- urea, electron diffrn. study 3=3310
- urea, n.m.r. of H^1 , analysis by lattice harmonics 3=5047
- vaseline, electromagnetophoresis 3=16901
- vinyl acetate, polymerization, effect of ionising radiations 3=6925
- vinyl cpds, polymerization, molecular motion 3=23545
- vinylamine, improved LCAO method 3=4774
- vinyl chloride, kinetics of HI addition 3=11338
- vinylidene fluoride, microwave spectrum and structure 3=17595
- viologen free radicals, e.s.r. spectra 3=20028
- vitamin-A acid, triclinic, crystal structure 3=8870
- xylene-based liquid scintillators, intermediate transfer of excitation 3=16629
- p-xylene, i.r. intensity calculation 3=15369
- BF_3 , diethyl ether, Raman and i.r. spectra 3=15361
- BF_3 , tetrahydrofuran, Raman and i.r. spectra 3=15361
- C-C and C-H bonds, diamag. anisotropy 3=22585
- C_6 hydrocarbons, C^{11} recoil reactions 3=11359
- $(\text{C}(\text{CH}_3)\text{CH})_2$, internal rotation isomers 3=25082
- CCl_4 liquid, mol. theory 3=21317
- CCl_4 , force const. from vibr. data 3=6376
- CCl_4 , liquid, i.r. absorption spectrum, 740-810 cm^{-1} 3=23884
- CCl_4 , liquid, optical constants from i.r. reflection 3=16624
- CCl_4 - C_6H_6 , CCl_4 - C_6H_{12} mixtures, velo., acoustic waves, var. 3=16622
- $\text{CCl}_3\text{C}(\text{OH})_2\text{C}_2\text{H}_5$, Cl^{35} nucl. quadrupole resonance 3=15964
- CClF_3 , u.s. cavitation, neutron induced 3=14122
- CD_3 , abstraction of primary, secondary and tertiary H atoms 3=3384
- CD_4 , liquid and solid, thermodynamic props. 3=22658
- CF_4 , force const. from vibr. data 3=6376
- CF_4 , i.r. spectrum, 1850-3100 cm^{-1} 3=6406
- CF_4 , liquid, n.m.r. and diffusion 3=21412
- CF_4 -Ar, liquid, n.m.r. and diffusion 3=21412
- CH group, Raman spectra, intensity, var. with excitation freq., 5461-3021A 3=25117
- CH_2 radical, ionization potential 3=360
- CH_3 , spectra, i.r., and vibr. assignments and excitation energies 3=15363

Organic compounds — contd

- CH₃, spectrum and ioniz. potential 3=7328
 CH₃, spectrum and ioniz. potential 3=7328
 CH₄ electron avalanche components, temporal growth meas. 3=4086
 CH₄, liquid, n.m.r. and diffusion 3=21412
 CH₄, liquid and solid, thermodynamic props. 3=22658
 CH₄ β-quinol clathrate, CH₄ motion, 15°-100°K, free heat capacity 3=8284
 CH₄-A, CH₄-CO systems, thermodynamic props., ~ 90°K 3=14145
 CH₄-Ar and CH₄-CO solutions, heat of mixing and volume change 3=1682
 CH₄-Ar, liquid, n.m.r. and diffusion 3=21412
 CH₄, BH₄⁻, NH₄⁺, isoelectronic systems, electronic props. 3=22554
 C₂H₂ molecule metastable states by electron bombardment 3=4742
 C₂H₂ molecule metastable states by electron bombardment 3=4742
 C₂H₂ ion, in mass spectra, paraffins from C₁ to C₈, field ionized 3=14524
 C₆H₆-CCl₄, C₆H₆-C₆H₁₂, C₆H₆-neopentane, C₆H₁₂-CCl₄, C₆H₁₂-neopentane mixtures, velo., acoustic waves, var. 3=16622
 (CH₃)₃C³⁵Cl, microwave spectrum and quadrupole coupling constant 3=4769
 CH₃CHF, n.m.r. and double resonance in gas phase 3=6420
 CH₂-(CH)₂=CH₂, radical, C atom spin densities 3=15393
 CH₃CH₂HgX, nuclear spin coupling H¹-Hg¹⁹⁹ 3=25145
 CHCl₃, liquid, i.r. absorption spectrum, 740-810 cm⁻¹ 3=23884
 CHCl₃, refractivity, second virial coeff. 3=3835
 CH₂DCOH, CD₂HCOH, analysis of microwave rotational spectrum 3=8288
 CHF₃, gaseous, proton magnetic resonance, medium effects 3=9517
 CH₂F, refractivity, second virial coeff. 3=3835
 CH₂F, n.m.r. and double resonance in gas phase 3=6420
 CHFCl₂, nuclear spin relaxation in liquids 3=7220
 CH₃HgX, nuclear spin coupling H¹-Hg¹⁹⁹ 3=25145
 (CH₃)₂NP group, n.m.r. 3=4782
 (C₂H₅)₂NP group, n.m.r. 3=4782
 C₆H₅O₁₃, OH bond orientation 3=4968
 (CH₃O-C₆H₅)₂NO, h.f.s. and coupling consts., from e.s.r. 3=14183
 CH₃OH, ionization potential, higher, using electron impact Foxgun 3=14520
 C₂H₅OH, e.s.r. of trapped Ag, 77°K 3=25575
 C₂H₅OH, ionization potential, higher, using electron impact Foxgun 3=14520-
 C₆H₁₂O₂H₂O, OH bond orientation 3=4968
 CH₃OOCH₃D, analysis of microwave rotational spectrum 3=8288
 (CH₃)₂X type mols., torsion vibr. theory 3=2598
 C₆O₈H₆, OH bond orientation 3=4968
 C₆O₈H₂.2H₂O, OH bond orientation 3=4968
 Ca₂Sr(C₆H₄CO₂)₆, optical birefringence 3=20445
 Co(ethylenediamine)₃³⁺, optical rotatory dispersion 3=730
 Co phthalocyanine crystals, spectra, absorpt. polarization 3=20495-6
 Co, vibration, fourth positive system, Franck-Condon factors, calc. 3=17571
 (CrMn)B, Curie points and magnetic moments 3=8637
 Cs polycyclic aromatic cpds., photoelectric emission 3=16975
 Cu acetylacetone, polarized absorption spectrum, 11000 to 22 000 cm⁻¹, 30° to 300°K 3=3027
 Cu dihydroxy-para-quinone, mag. susceptibility at low temps. 3=1060
 Cu formate 4H₂O, mag. susceptibility at low temps. 3=1060
 Cu oxinate, crystal growth and dimorphic transformations 3=18257
 Cu phthalocyanine, crystal growth and dimorphic transformation 3=18257
 Cu phthalocyanine crystals, spectra, absorpt., polarization 3=20495-6
 Cu phthalocyanine, Hall effect and carrier mobility 3=2911
 Cu quinone complex salts, mag. susceptibilities 3=11103
 DPPH, h.f.s. and coupling consts., from e.s.r. 3=14183

Organic compounds — contd

- Dy ethyl sulphate, demagnetization expts. 3=1056
 Dy ethyl sulphate, spin-lattice relaxation 3=1194
 Eu benzoylacetate, optical maser action 3=17084
 Eu chelates, fluorescent lifetimes 3=20513
 Eu dibenzoyl-methide, stimulated light emission 3=23886
 Eu³⁺ in organic matrix solid solution, optical maser action 3=25443
 EuR₃ (R is organic radical), for possible maser, optical, by internal energy transfer 3=17072
 Eu salicylaldehyde, as laser material 3=9980
 Eu tris-dibenzoylmethide, fluorescence spectra, lifetimes 3=8628
 Fe-nitrosyl complexes, Mössbauer effect interpretation 3=25125
 K vanadyl oxalate, e.s.r. study 3=1189
 KF.2Al(C₂H₅)₃, crystal structure 3=11272
 La ethyl sulphate, Pr-doped, absorption and fluorescence spectra, Pr bond covalence 3=23072
 MnCl₂.2C₂H₅.HCl, fluorescence lifetime and intensity 3=8613
 (NO₂C₆H₄)₂NO, h.f.s. and coupling consts., from e.s.r. 3=14183
 Na benzo-acetate, salicylate, luminescence, temp. var. and dosimetry 3=17117
 Na carboxymethyl cellulose gel. diffusion of water 3=1403
 Na fluorescein aq., luminesc., KI quenching 3=3807
 Na-fluorescein, lumin. quenching in aq. and glycerin solutions 3=14173
 Na soap films, electron diffraction patterns 3=16145
 Ni phthalocyanine crystals, spectra, absorpt., polarization 3=20495-6
 Pt phthalocyanine, dislocation dipoles rel. to fission fragments 3=20253
 Rb tetraphenylborate, crystal structure 3=20862
 SmR₃ (R is organic radical), for possible maser, optical, by internal energy transfer 3=17072
 Sn-organic cpds., Mössbauer effect rel. to γ-irrad. 3=17633
 Sn-organic, Mössbauer spectra anomalies, rel. to chemical bonds 3=744
 Sn(C₆H₅)₄, Mössbauer effect 3=8340
 Tb tri-anthranilate, fluorescence spectra, lifetimes 3=8628
 Ti (III) acetylacetate, e.s.r. 3=8715
 Ti³⁺ in alcohol and glycerol, e.s.r. and absorption spectra 3=1712
 VYNS, energy loss of 4-30 keV H¹ and He⁴ 3=4394
- Oscillations**
 See also Electromagnetic oscillations; Liquid oscillations; Piezoelectric oscillations; Vibrations.
 ammonia N¹⁴H₃ maser, travelling wave frequency shift 3=6116
 amplitude meas., two interference methods 3=23957
 conducting fluid layer in mag. field, resonance effects 3=24455
 core in solenoid electromagnet 3=5628
 coupled, complex frequency analysis 3=5476
 cylinder, compressible, non-radial vibs. 3=21086
 drops, organic liquid, falling through water 3=7196
 electron gas, long-range density effects 3=9371
 fluid sphere, m.h.d., about equipartition state 3=9912
 inviscid flow between rotating cylinders, non-rotationally symm. disturbances 3=1714
 Jacobi, Maclaurin and Jeans spheroids, stability 3=16681-4
 magnetron, plasma-filled; analysis 3=6290
 nonlinear sampled-data systems, method of determination 3=6500
 operational amplifiers, relation to computer errors 3=6564
 parametron, amplitude limiting and hysteresis 3=4985-8
 quartic oscillator, energy levels and matrix elements 3=14030
 quasi-discontinuous, model 3=1743
 self-sustained, in relay sampled-data systems 3=6501
 theorems for finite degrees of freedom 3=7086
 thermal-mechanical coupling 3=9380
 thermoelastic, isentropic motion, finite deform. 3=18883
 threshold, atomic hydrogen maser 3=6106
 in transport process systematization 3=5392

Osmium

superconducting, isotope effect meas. 3=19121

Osmium compounds

superconductivity 3=24148

Os-Ir, superconductivity 3=3962

Osmosis

binary systems, thermodynamic limit 3=14151

polymer solns., second virial coeffs., rel. to mol.

weight 3=3802

polystyrene solns., second virial coeff. calc. 3=16615

He³, in liq. He⁴, refrigerator for <1°K 3=5565

Oxidation

acetylene, chemi-ionization by O atoms 3=16904

anodes, ion transport mechanism 3=13616

carbonized anthracite aggregates, contact resistance 3=8545

electron microprobe examin. 3=3377

graphite, effect on rhombohedral modification, by X-ray

diff. 3=18309

graphite, structural aspects, study 3=20985

graphite, thermal 3=25821

kinetics, gas, 1-100 msec, by adiabatic

compression 3=20981

magnesiowustite single crystals 3=20986

metals 3=20984

metals, during vaporization in Ar + O₂ 3=24120

metals, films, and absorption, light 3=17991

metals, oxide film growth, kinetics 3=25775

semiconductor formation, effect of equilibrium

conditions 3=25824

wüstite, O/Fe ratio rel. to oxygen press. 3=5076

Al, direct electron-microscope obs. 3=11336

Al, films, reflectivity decrease 3=23039

Co, films, and absorption, light 3=17991

Co submicron whiskers 3=23412

Co-Al alloys, around Curie point 3=11337

Co-Pd, reactivity, anomaly, at Co Curie point 3=20982

Cu, and film growth mechanism 3=23516

Cu, effect on elec. cond. and chemoemission, up to

600°C 3=2012

Cu, electron-diffraction study 3=13417

Cu, electron microscope obs. 3=18435

Cu, films, and absorption, light 3=17991

Cu-Bi alloys 3=18221

Cu-Ni, oxide film formation 3=18432

Cu-Si alloys 3=18221

Fe, in atmosphere of Ar + 10% water vapour 3=3268

Fe, films, and absorption, light 3=17991

Fe, Fe-C submicron whiskers 3=23412

Fe-Al alloys, around Curie point 3=11337

Fe oxide growths, rel. to surrounding gas 3=18433

GaAs wafers in oxygen stream 3=2943

Ge, nucleation of oxide, dislocation effects 3=25276

Mg crystal faces, oxide film growth 3=23512-13

Mg, single crystals and films 3=11335

Nb, anodic film structure 3=23507

Ni, films, and absorption, light 3=17991

Ni films, rel. to magnetic properties 3=15823

O¹⁸ atoms with NO₂ 3=13598

Pd-H soln. in constant current, anodic 3=5166

ReSi₂, resistance to 3=872

Se, polycrystalline, rel. to conductivity ratio 3=17893

Si, and film growth mechanism 3=23516

Si, oxide films on surface, 300°-1000°C 3=25439

Si, rel. to Al-dopant redistribution 3=17866

Si, thermal oxid. mechanism 3=13600

Ta, anodic, film structure 3=23507

Ti, 500°C, electron microscope study 3=18434

U, from X-ray M_ν emission, spectrum last lines 3=23558

U, oxidized in air at increasing temps. 3=3250-1

Zr, anodic film structure 3=23507

Oxide cathodes

See Cathodes, oxide.

Oxygen

adsorbed on metals, effect on elec. cond. and superconductivity 3=16872

adsorption on Ge, kinetics and mechanism 3=3365

adsorption, on Ni films, effect on elec. resist. 3=20271

adsorption on Ni oxide, crystal field effects 3=13573

adsorption on NiO, neutron effects 3=13567

Oxygen — contd

in airglow, day and twilight, (0,0) band obs. at

1.27 μ 3=18553

arc plasma, Stark-broadened spectral lines, shifts and widths 3=24277

atmosphere, O/O₂, 100-135 km, by mass spectrometer,

rocket-borne 3=18522

atmospheric microwave spectra 3=13679

atom, electron capture by protons 3=15503

atom, free-free continuum spectrum, rel. to

polarization and exchange 3=17531

atom, 1s²2s^m2pⁿ states, self-consist. field func-

tions 3=19942

atom reaction with CO 3=5159

atom reaction with olefins, rate meas. 3=11341

atom recombination by Ar catalysts 3=13595

atom recombination in inert gases 3=13597

atomic, chemiluminescence, in O and N reactions 3=25819

atomic recombination, by e.s.r. 3=25068-9

atomic system, continuous absorption coeff., rel. to

stellar atmospheres 3=3599

atoms, charge transfer with atmospheric ions 3=14531

atoms, reactions with isobutane 3=11340

breakdown, microwave, meas. 3=14560

charge transfer cross-sections 3=14530

chemical reaction O + NO₂ = NO + O₂, via NO₃, isotope

exchange 3=18436

chemi-ionization in atomic mixtures with N 3=25820

chemisorption on NiO after neutron irradi. 3=3366

chemisorption on W, 20° and 300°K 3=3396

diffusion in GeO₂, liquid and solid 3=20224

diffusion in Si during thermal oxidation 3=13600

diffusion in TiO₂, quartz and quartz glass 3=2831

discharge, glow, ions, mass spectrometry 3=14552

discharge, positive column fields, 10⁻⁶-10⁻¹ A 3=19213

dissociation by electron impact, O⁻ prod. 3=361

electron conductivity after weak ioniz. 3=3839

electron irradi., free electron loss 3=14598

electron trapping by impurity in liquid argon 3=19175

equilibrium props. behind shock waves 3=21493

Faraday effect, theory 3=5468

gas, absorption and velocity of sound 3=9506

gas, Aston bands, rel. to ionization 3=4020

gas, discharge detector 3=8993

gas, microwave ionization, net frequency 3=9723

gas, microwave (3 cm) breakdown in flowing gases 3=9516

gas, permeability of Ag 3=13549

gas release from glass, on electron bombardment 3=16124

gas, sound velocity and absorption 3=9509

gaseous, nucleation temp. 3=303

gettering, electrical in low-pres. discharge in steel

vessel 3=7461

interaction with CdSe surfaces, meas. 3=11326

intermolecular repulsion, from intramol. oscill. relax.,

temp. var., from shock wave propag. 3=12881

ion emission, field 3=19371

ion mass, discharge glow, O₂⁺, O⁻, O₂⁻ 3=19183

ion, O¹⁸, charge distrib. at high velocities 3=7447

ion scatt. by C, Mg and Al, elastic 3=19891

ions, mobility, in O₂ and O₂-H₂O mixtures 3=12080

ions, O⁻, prod. cross-sections and electron affinity 3=361

ions, single, exosphere, distrib., 1500, 2000°K 3=16240

ions, O₂⁺, O⁻, O₂⁻, O₃⁻ in pure gas, by mobility

meas. 3=7438

isotopes, relative abundance, mass-spectra 3=12785

liquid, absorption bands rel. to pressure (to 7000 atm),

temp. (78°-300°K) and density 3=1692

liquid systems, binary, with N and A 3=132

liquid, viscosity and mol. interaction 3=9423

molecule, dissociation by Ar, statist. study 3=6423

molecule, dissociation and vibr. rates meas. 3=7274

molecule, neutron scatt., quantum states

transition 3=25074

molecule, proton scatt., two-state and

multistate 3=25104

molecule, rotational transitions due to He 3=6431

molecules, adsorption on W 3=6887

molecules, dissociative charge transfer from He⁺ 3=24224

molecules, electron attachment coeff. at low energy 3=362

Oxygen — contd

- molecules, electronic transition moment for Schumann-Runge bands 3=724
 molecules, O_2 , 6300-3000 Å absorption spectrum 3=6395
 molecules, O_2^+ , vibrational spectrum 3=8266
 molecules, photo-ionization efficiency curves, 9-14 eV 3=24211
 molecules, vibration, excitation by impurities, high temp. 3=17581
 positron annihil. in liq. and solid 3=17254
 quenching of luminescence, solute mols. in cyclohexane soln. 3=3810
 refractivity, second virial coeff. 3=3835
 self-diffusion in PbO, oxidation process 3=20230
 solid, absorpt. band at 1550 cm^{-1} 3=3010
 solubility in Be, X-ray diffrac. study 3=20908
 solubility in H_2O , isotope effect 3=9450
 sorption on NiO, MgO, neutron irradiated 3=13604
 sorption on NiO, 20-400°C 3=13603
 sound absorption, water vapour effects 3=18860
 spectra, airglow, synthetic 3=6989
 spectra, emission, excited by protons and H atoms 3=15338
 spectra in highly ionized state, meas. 3=10448
 spectrum, Schumann-Runge system, Franck-Condon factors 3=10521
 in tektites, isotope ratio 3=9014
 u.s. absorpt., relaxation time 3=18857
 H_2-O_2 flame, emission absorpt., and temp. 3=5162
 O I, quintet, triplet terms, below ionization limit 3=22487
 O VIII, impurity in deuterium plasma, X-ray spectra 3=7581
 O^{15} atom, 3P_2 hyperfine splitting, rel. to nuclear mag. dipole moment and spin 3=19945
 O^{17} , hyperfine structure, by electron paramagnetic resonance 3=6353
 O^{17} n.m.r. in MgO 3=20682
 O^{17} n.m.r. shifts caused by Cr^{3+} in aq. solns. 3=9481
 O^{17}/O^{18} abundance ratio, accurate formula 3=25071
 O^{18} , rain water content. 3=25897
 O^- , photodetachment spectrum 3=4003
 O^- recombination, on exposure to Ag surface 3=18442
 O^{+} , electron impact ionization cross-section 3=5619
 O^{+} , electron impact ionization cross-section 3=5619
 O^{+} excitation cross-section 3=4713
 O^{6+} , 2^3s state, 20-parameter calc. 3=2561
 O_2 , absorption lines, microwave frequency 3=22548
 O_2 afterglow, electron removal 3=4064
 O_2 band excitation in nightglow 3=9103
 O_2 band spectra 3=10503
 O_2 collisions of He^+ 3=21707
 O_2 , corona, positive burst pulse formation, theory 3=372
 O_2 dissociation in auroral polar mesosphere 3=11450
 O_2 , electron attachment coeff. 3=19174
 O_2 , electron interchange with H atom beam 3=6342
 O_2 flow-discharge, stratified, negative ion extraction 3=4063
 O_2 gas, fluorescence, possibility 3=9513
 O_2 gas, thermal conductivity, 300° to 1100° K 3=16655
 O_2 , Hopfield's emission bands 3=8267
 O_2 , ionization, mass spectrometric meas. 3=12070
 O_2 ionization by protons, 0.15-1.1 MeV 3=4006
 O_2 , microwave absorption, freq. rel. to pressure 3=23938
 O_2 molecule metastable states by electron bombardment 3=4742
 O_2 and O_2-N_2 discharge afterglows, free electron attachment 3=4009
 O_2-O_2 ionization collisions meas. 3=4015
 O_2 , Schumann-Runge band system, transition moments, detm. 3=19987
 O_2^+ , u.v. excited, fluorescence 3=4753
 O_2 , atmospheric, in jet streams 3=21035
 O_2 dil. soln. in liquid N_2 , photolysis in u.v. 3=3408
 O_2-CF_4 liquid system, phase diagram and solubility 3=21334
 in Si, diffusion, solubility, light absorpt. and other effects 3=15579
 in Si, n-type, effect on trapping 3=22935

Oxygen compounds

- diatomic, Franck-Condon factors 3=22536
 $mX^{++}O.UO_2.nH_2O$, general structural, formula 3=3305

Oxygen compounds — contd

- OD, e.s.r., from D_2O soln., 77° K, u.v. irradiated 3=20012
 OD^+ rotational band analysis 3=12829
 OF_2 , microwave spectrum and structure 3=8278
 OF_2 , microwave spectrum, spin-rotational hyperfine structure 3=19995
 OH, e.s.r., from H_2O soln., 77° K, u.v. irradiated 3=20012
 OH, electronic trans., Franck-Condon factors, calc. 3=12827
 OH nightglow emission, correlation with Na 3=3511
 $OH\Sigma^+\Pi$ band system, and temperature measurement in shock tubes 3=7281
 OH, stabilization in ice, under γ irradiation 3=25150
 OH, vibrational transition probabs. calc. 3=12803
 $O^{17}, ^{18}H$, dipole moments, h.f.s. 3=12828
 O_2-H_2O mixtures, thermal conductivity, 300° to 1100° K 3=16655

Ozone

- in atmos., rel. to time and atmosph. quantities 3=1428
 in atmosphere, rel. to sunspots 3=13658
 atmospheric 3=13662
 atmospheric and sunspot cycle, comments on Willett 3=13659-60
 atmospheric, i.r. obs. 3=16207
 atmospheric rel. to moon 3=13661
 atmospheric, variation and distrib. with height 3=5194
 electronic structure, config. interaction calc. 3=22571
 mol. structure det. from moments of inertia 3=2597
 planets, Mars 3=18608
 spark-produced in air, rel. to breakdown voltage 3=4100
 stratosphere-troposphere exchange and global supply 3=6953

pH

See Electrochemistry.

Pair creation

See Electron pairs; and under individual particles, e.g. Mesons.

Palladium

- antiferromagnetism, absence of 3=15913
 atoms, \mathbb{I} spectrum and levels 3=12765
 atoms, X-ray spectrum, L-absorption 3=4710
 conduction electron polarization round mag. impurities 3=8709
 deuteron scatt., elastic, 11.8 MeV 3=17490
 electrical cond. rel. to H content 3=22896
 electron microcharacteristics meas., by optical constants 3=15467
 film on Ag, Pd, Ni, structure 3=1371
 film, temperature rise, rel. to electron irradi. 3=17807
 mag. susceptibility, electronic sp. ht. 3=13228
 magnetic moment distrib. 3=1110
 magnetic suscept., 1.85-293° K, meas. 3=13229
 magnetoelectric effects in fields up to 180 kOe, at 4.2° K 3=4909
 μ^- -mesic atom, decay anomalies, search 3=2593
 paramagnetic resonance of Gd, effect of hydro-generation 3=15944
 specific heat, electronic contrib. at high temp. 3=10600
 thermodynamic props., 30-300° K 3=12924
 vacuum pump using diaphragm, heated, for H 3=14225
 vaporization, heat of, at 298° K 3=1876
 H_2 diffusion, mass spectrometry 3=2829

Palladium compounds

- alloys, dilute, with Co, Fe, Ni or Mn, magnetic transitions 3=992
 superconductivity 3=24148
 Pd alloys, binary, mag., elec. and cryst. props. 3=1126
 Pd alloys, paramagnetic resonance of Gd, effect of hydro-generation 3=15944
 Pd-transition metals, mag. interactions 3=3078
 PdAg alloy, vacuum pump using diaphragm, heated, for H 3=14225
 Pd-Ag solid solutions, optical consts. rel. to concentration 3=2991
 Pd cobaltite- and pyrite-type compounds, superconductivity, > 1° K, semiconductivity 3=21663
 Pd-Fe alloys, atomic magnetic moment 3=15737
 Pd-Fe, low temp. resistivity 3=13035

Palladium compounds — contd

- Pd-H alloys, thermodynamic props., 30-300°K 3=12924
- Pd₂H, energy evolution below 1°K 3=9665
- Pd-H soln. in constant current, anodic oxidation 3=5166
- Pd-H system, phase transformations, isotherms hysteresis 3=25750
- Pd₂Mn, antiphase domain structure, by neutron diff. 3=6729
- Pd-Rh alloys, mag. suscept., low-temp. meas. 3=13229

Paper

- dielectric anisotropy, oriented fibres, 3000 Mc/s 3=22990
- surface structure under rolling pressure 3=13553

Paramagnetic resonance and relaxation

See also Masers.

- A_{II} B_V cpds, Mn²⁺ impurity local dilatations 3=1192
- absorption lines, general form, in transverse fields 3=25134
- acenaphthene-ion, h.f.s., hyperconjugation mechanism 3=22591
- acetyl-L-glutamic acid, γ -irrad., e.s.r. 3=3164
- acoustic paramagn. resonance in S-state ions 3=2725
- alkaline ice, rel. to O⁻ radiolysis production 3=23233
- α,α -diphenyl- β -picryl hydrazine, neutron irrad. 3=15371
- α -quartz, containing Ge, colour centres 3=22832
- amalgamation in alternant spin system 3=20640
- amino acids, γ -irradiated, e.s.r. spectra, temp. depend. 3=20019
- Ampere Colloquium, Eindhoven (1962) 3=20629
- Ampere Colloquium, Leipzig (1961) 3=23198
- ang. modulation of d.c. mag. field, use 3=13295
- anthracene negative ion soln., Bloch eqns. 3=6744
- aromatic anion radicals, nitrosubstituted, hyperfine splittings 3=22593
- aromatic mols., hyperfine coupling consts. calc. 3=17552
- aromatic mols., in triplet state, line shape, $\Delta m = 2$ transition 3=25135
- arylsulphenyl radicals, g-value anisotropy 3=25137
- asphaltene, Bloch eqns. sols. 3=6744
- asphaltene solns., double resonance 3=7221
- atomic recombination study 3=25068-9
- azulene anion, e.s.r. spectrum, erratum 3=8310
- benzene and derivatives, phosphorescent 3=21417
- benzene, e.p.r., spin-spin interaction, correction 3=8290
- benzyl, in polycrystals, second moment calc. 3=25560
- bipyridyl radical, biquaternary, spin densities 3=2654
- bis (2,2' biphenylene) methane, ions, and electronic interactions 3=15362
- Bloch eqns. for low mag. fields, approx. soln. 3=6744
- Bloch system analogue for spin $S > \frac{1}{2}$ 3=18125
- carbazole-chloranil charge transfer complex 3=8708
- carbazole donor diphenyl acceptor mixtures, in irrad. ether-ethanol glasses, 77°K 3=22595
- carbon tetrafluoride, γ -irradiated at low temp. 3=12874
- carbonyl anion radicals 3=6429
- conference, Jerusalem (July, 1962) 3=1177
- coronene, $\Delta m = 1$ transitions 3=1186
- corundum, anisotropic spin-orbit coupling of d³ and d⁵ solutes 3=2694
- corundum, Co²⁺ ions 3=6745
- corundum, spin-lattice- and cross-relaxation 3=6753
- corundum, Ti³⁺ ion spin-lattice relax. 3=6752
- covalency calc., effect of charge transfer levels 3=8705
- cross-relaxation in crystals, theory 3=18142
- crystals, broadening, due to indirect exchange interactions 3=20638
- crystals, effect of dislocation on lineshape 3=15933
- crystals, role of electric fields 3=20639
- cycloheptatriene cycloheptatrienyl radical 3=4778
- cycloheptatrienyl, e.s.r. in naphthalene crystals 3=1184
- 1,4-cyclohexadiene 3=12859
- DNA bases, free-radical yields, rel. to γ -irrad. 3=22606
- DPPH, g-tensor anisotropy 3=23227
- deformation effects, crystals, by spin-phonon interaction 3=18124
- derivative form, signal distortion, rel. to measuring arrangement 3=24489
- diamagnetic line splitting 3=23221
- diamonds, IIa, e.s.r., rel. to defects 3=6746

Paramagnetic resonance and relaxation — contd

- diamonds, vacancies, investigation 3=17710
- dibenzo-p-dioxin, radical, e.s.r., h.f.s., p and C¹³ 3=20017
- 2,7-dichlorothianthrene, in conc. H₂SO₄ 3=20013
- dinitrobenzene anion radicals, linewidth alternation 3=4776
- diphenyl acceptor carbazole donor, mixtures, in irrad. ether-ethanol glasses, 77°K 3=22595
- diphenyldiazomethane, in benzophenone, solid soln., triplet state, 77°K 3=4775
- dye photoconductors 3=23021
- dyes used in spectral sensitization of photographic materials 3=11950
- electric fields, effects, Fe group ions 3=18126
- electron delocalized in system of equiv. potl. wells, h.f.s. 3=1178
- electron spin correl., rel. to nuclear relax. 3=5046
- N-ethylacridone, triplet states 3=962
- ethylene diamine copper II nitrate 3=8706
- F-centres, absorption curve, shape calc. 3=15519
- F-centres in magnetic fields 3=17797
- ferric acetylacetonate, zero-field energy levels 3=23228
- ferromagnet above Curie temp., Green's function theory 3=25561
- first and second derivatives, sensitive recording method 3=21993
- fluids, effects of acoustic resonance 3=16706
- fluorides, iron-series, hyperfine effects 3=15955
- free radical, lifetime, effect 3=8311
- free radicals, anomalous alternating linewidths 3=2653
- free radicals in dilute soln., line-widths theory 3=23911
- free radicals in polymethacrylate, dependence on γ -dose 3=25563
- free radicals prod. in irradiated benzene and derivatives 3=2670
- free radicals, in soln., e.s.r., and h.f.s. 3=14183
- frequency variation, simple method 3=14785
- G-tensor asymmetry in spin Hamiltonian, conditions for 3=3163
- glasses, organic solns., u.v. irrad. 3=5041
- glycine, γ or X-irrad., h.f.s., temp. var. 3=18132
- glycylglycine HCl, irradiated crystals 3=15942
- graphite, neutron-irradiated rel. to annealing 3=22867
- graphite, polycryst., theory and meas. 3=3174
- graphite, single crystals, neutron irradiated 3=13296
- graphite, spin suscept. meas. in low field 3=25501
- high-field expts, 35-70 kMc/s 3=1158
- high-resolution 3=21987
- hindered internal rotation effect 3=12861
- hydrazyl-type radicals in viscous media 3=21418
- ice, γ -irradiated 3=2669
- inhomogeneous lines, structure, study by h.f. modulation phenomena 3=21988
- ion pairs, spin-lattice relaxation rate 3=3167
- irradiated aromatic systems 3=15372
- irradiated frozen aq. soln. of S cpds. 3=15391
- ketyls, rel. to coupling consts and spin densities 3=4777
- lanthanide salts, audiofrequency dispersion effects 3=2324
- line shapes in inhomogeneous fields 3=21989
- liquids, relax., molecular shape effect 3=21405
- magnetic field meas. application 3=2080
- many-component disordered crystals, term splitting 3=22624
- mercaptosuccinic acid, γ -irradiated crystal 3=13304
- metal films, spin resonance, d.c. detection 3=15934
- metalammonia solutions, relax., by microwave spin echoes 3=21414
- metals, soln. in NH₃, e.s.r., effect of adding electrolyte 3=11811
- methane, γ -irradiated at low temp. 3=12874
- methylene derivatives, spin-spin interaction 3=10535
- methylene, spin-spin interaction 3=17602
- molecular triplet states 3=962
- molecules, deriv. of chemical bonds 3=17611
- molecules, randomly oriented, powder line shape 3=17612
- multilevel spin system, spin-lattice relaxation rel. to temp. 3=3184
- naphthalene, $\Delta m = 1$ transitions 3=1186

Paramagnetic resonance and relaxation — contd

- naphthalene mononegative ions, dimethyl substituted series, e.s.r. 3=12857
 naphthazarin, radical, anion, e.s.r. and H-bonds 3=17610
 bis(p-nitrophenyl) anions, electron transfer effects, h.f.s. 3=22597
 nonconductive crystals, spin diffusion, relaxation, dynamic polarization 3=15957
 nuclear moments calc. from h.f.s. 3=2362
 nuclei in solids, dynamic polarization, rel. to temp. concentration 3=18146
 octacyanide complexes 3=725
 n-octadecyl disulphide, γ -irradiated 3=6416
 organic dyes, spectra 3=15938
 organic molecules, photo-excited triplet states 3=1181
 organic phosphors, triplet states invest. 3=5035
 paraelastic centre, relaxation mechanism 3=23220
 paramag. crystals, spin-spin interact. via phonon fld. 3=6756
 paramag. salts and metals, u.s. wave absorption 3=20097
 paramagnetic crystals, orientation by e.s.r. anisotropy 3=16022
 passage effects with inhomog. broadening 3=15923
 phthalocyanine dyes, impurity $g = 2$ lines 3=20653
 π -electron radicals in polycrystals, second moments 3=25560
 polyethylene, irradiated, free radical decay 3=2671
 polyformaldehyde, γ -irrad., free radicals 3=12858
 polymethacrylic acid, trapped electrons 3=2684
 polytetrafluoroethylene, irradiated oriented 3=17608
 porphyrins 3=25129
 pyracene free radical 3=22590
 pyracene ions, h.f.s., hyperconjugation mechanism 3=22591
 pyrene anion, e.s.r. spectra 3=8310
 pyrocarbon, absorpt. rel. to sample orientation 3=13305
 quartz, E' -centres, spin-lattice relax. 3=13009
 quartz, E_g' -centres, theory and expt. 3=13008
 quartz, Ge-doped, colour centres 3=20239
 quartz, rose-coloured, e.s.r. of colour centres 3=8459
 quartz spin-lattice relaxation, rel. to neutron-irrad. 3=18136
 quinizarin, radical, anion, e.s.r. and H-bond 3=17610
 radiation-induced free radicals in polycryst. sulphur cpds. 3=3413
 radicals, in liquids, spin-lattice relaxation 3=3817
 rare-earth ethylsulphates, spin-lattice relaxation data 3=25579
 rare earth ions in dil. salts, hyperfine struct. 3=1179
 rare-earth metals, hyperfine interactions 3=15954
 rare-earth salts, spin-lattice relax., field depend. 3=18144
 relaxation, spin-lattice, in ionic crystals 3=6755
 relaxation theory, rel. to ultrasonic spin resonance meas. 3=23240
 relaxation, theory, review 3=23219
 resonance line shift due to spin-phonon interaction 3=3162
 Rochelle salt, irradiated 3=20654
 ruby, absorption of 9.3 kMc/s phonons 3=1190
 ruby, and internal field non-uniformity 3=20048
 ruby crystals, appraisal for maser use 3=22763
 ruby, relax. time meas., d.c. magnetiz. technique 3=13306
 ruby, spin-lattice relax. theory 3=15952
 sapphire, Ni^{2+} absorption 3=1187
 semiconductors, combined electron resonance 3=15931
 semiconductors, group II-VI, and phosphors, conduction electrons 3=20642
 semiconductors, impurity electron states study 3=4911
 semiquinones, C^{13} hyperfine interactions 3=22589
 shape, polycrystals, anisotropy, h.f.s. 3=23223
 silica gel, γ -irrad., H atoms formed 3=3419
 solids, minimum entropy production 3=23222
 solvent effects 3=6415
 and spectra, diatomic molecules, for radio-astronomy 3=19988
 spectrometer, high-frequency modulated 3=21990
 spectrometers, e.s.r., resonant-cavity and travelling-wave types 3=516
 and spin Hamiltonian ion parameters, calc. 3=18127
 spin-lattice effects, rel. to microwave propag. 3=18139
 spin-lattice relax., phonon processes 3=15428
 spin-lattice relax. processes, direct, theory 3=8722

Paramagnetic resonance and relaxation — contd

- spin-lattice relax. in S-state ion crystals 3=25562
 spin-lattice relax. times, temp. dependence 3=6757
 spin-lattice relaxation in paramagnetics with strong exchange interaction 3=18141
 spin-orbit coupling, anisotropic, effects 3=20641
 spin-phonon interaction in relaxation 3=3182
 spin relax., size-dependent, model 3=8720
 spin relaxation, Fokker-Planck eqn. 3=1623
 spin-spin relaxation, recent developments, review 3=1196
 statistical mechanical theory 3=21254
 in strong fields, harmonic analysis of signals 3=14787
 substituted aromatic ions, perturbation model 3=12860
 substituted benzaldehyde ions, rotational isomerism 3=15373
 Teflon, liq.-He temp. 20657
 tetracyanoquinodimethane ion radical salts 3=11109
 tetramethyl ammonium chloride, γ -irradiated crystal 3=8716
 thioxanthone S, S-dioxide mononeg. ion 3=2655
 transition metal and rare earth ions, rel. to effective mag. flds. 3=977
 s-trinitrobenzene, photo induced, line splitting 3=18831
 1,3,5-triphenylbenzene, $\Delta m = 1$ transitions 3=1186
 triphenylene, $\Delta m = 1$ transitions 3=1186
 triphenylmethyl radical, spin densities, corrections 3=20018
 triplet spin exchange in ion radical salts 3=11109
 two-quantum transitions, two osc. fields at 90° 3=25559
 2,7-dimethylthianthrene, in conc. H_2SO_4 3=20013
 two-spin system, relaxation, theory 3=1624
 2,2'-dipyridyl anion, e.s.r., h.f.s., effect of reducing agent 3=20020
 ultrasonic, signal velocity meas. near resonant absorption 3=6759
 use of e.p.r. for study of microwave devices 3=14775
 use in magnetic field meas. in v. small volumes 3=25519
 viologen free radicals, photochem. produced 3=20028
 viscous media, relaxation time 3=1713
 X-band cavity, for liquid helium temps. 3=5884
 zero-field e.m.r. in inorganic and organic radicals 3=17609
 zero-field splittings in molecular multiplets 3=10535
 Ag atoms, in paraffins at 77°K 3=15948
 Ag, in distilled H_2O and C_2H_5OH , 77°K 3=25575
 AgBr, $g=2.04$ line rel. to anti-colour centre 3=6542
 AgCl:Co 3=15487-8
 Al monocrystal 3=5036
 Al^{3+} in ZnS, correl. with photocond. meas. 3=18128
 Al_2O_3 , doped microwave u.s. spin-phonon interactions 3=23242
 B, rel. to C content 3=11110
 $BaTiO_3$, paramagnetic particles 3=15935
 $BaTiO_3 + (ZrO_2, MgO)$, paramagnetic particles 3=15935
 C, amorphous, line-widths, rel. to O 3=3168
 CO_2^- radical, trapped 3=6418
 CaF_2 , doped, microwave u.s. spin-phonon interactions 3=23242
 CaF_2 , Eu-doped, e.s.r. absorption of 9.3 kMc/s phonons 3=1190
 CaF_2 :Ho, resonance, rel. to impurity ion behaviour 3=8710
 CaF_2 , rare earth ion spectra 3=3172
 CaF_2 with impurity valence changes 3=1180
 CaO, after neutron irradiat. 3=13169
 CdS:Cu, Ga, photosensitive centre 3=23224
 Cd Se: Mn, 3a field splittings 3=1192
 Ce^{3+} in dil. LaMg nitrate, spin-lattice relaxation time rel. to echo formation 3=1195
 $CeCl_3 \cdot 7H_2O$, liquid He temps. 3=8718
 Cm^{3+} , in $LaCl_3$ and La ethylsulphate 3=13299
 Co ion in X site of $La_2Zn(NO_3)_6 \cdot 24H_2O$, relax. 3=8723
 Co salts, spin-lattice relaxations of paramag. dispersion 3=23241
 Co^{2+} in CaO rel. to MgO, CaF_2 3=3181
 Co^{2+} in TiO_2 (rutile) 3=1183
 Cr in CdTe 3=20646
 Cr in K_2CrO_4 and $K_3NbO_4-K_2CrO_4$ 3=3186
 Cr ion pairs in ruby, exchange interactions 3=3187

Paramagnetic resonance and relaxation — contd

- Cr ions adsorbed by exchange of ions 3=8707
 Cr ions, electric fields, effects 3=18126
 Cr³⁺, Mn²⁺, Fe²⁺ in ZnS 3=20648
 Cr³⁺ in ZnS, cubic and hexagonal 3=3170
 Cr³⁺ salt solns. 3=3818
 Cr³⁺ in CdS, 1.4°K 3=23226
 Cr³⁺, e.p.r. spectrum at low and room temp. 3=25567
 Cr³⁺ in Al₂O₃, excited E(F) state 3=23225
 Cr³⁺ in Al₂O₃, linear elec. shifts 3=25568
 Cr³⁺ in Al₂O₃, matrix elements, calc. 3=3165
 Cr³⁺ in CaO rel. to MgO, CaF₂ 3=3181
 Cr³⁺, in corundum, spin-lattice relax. time, 4-90°K 3=5037
 Cr³⁺ in K₂Zn(SO₄)₆·6H₂O 3=18130
 Cr³⁺ in MgO, linear elec. shifts 3=25568
 Cr³⁺, in MgTiO₃, 24 and 35 kMc/s 3=15938
 Cr³⁺, in MgWO₄, 3=15939
 Cr³⁺, in ruby, spin-lattice relax. time, 9kMc/s 3=13298
 Cr³⁺, in SnO₂, spin Hamiltonian 3=20645
 Cr³⁺, in TiO₂, 3=14798
 Cr³⁺, in ZnWO₄, meas. and theory 3=3169
 Cr³⁺, in ZnWO₄, spin-lattice relaxation 3=25569
 Cr³⁺ ion in spinel 3=3171
 Cr³⁺ ions, effect of charge transfer levels 3=8705
 Cr³⁺ in glasses, 260-9320 Mc/s, 77°-295°K 3=18129
 Cr³⁺, in glycerol or water 3=7219
 Cr³⁺ in tetrahedral, octahedral and dodecahedral coordination, spin-lattice relaxation 3=13311
 CrBr₃ line widths 3=23204
 Cr(CN)₆NO³⁻, (Cr³⁺), C¹³ h.f.s. and lines 3=20014-15
 CrCl₃ line widths 3=23204
 [Cr(NH₃)₆]Cl₃ crystals, diluted with [Co(NH₃)₆]Cl₃, 9-2 kMc/s 3=1182
 Cr₂O₃, below Curie temp., 15 times reduction by heating at 1000°C 3=20643
 Cr₂O₃ on Al₂O₃, 3=13297
 Cs and Rb in methylamine, hyperfine splitting 3=16640
 Cs, soln. in NH₃, e.s.r., effect of adding CsI 3=11811
 Cu²⁺, octahedral complexes, spin inversion levels 3=25570
 Cu²⁺ in TiO₂, 3=25564
 Cu²⁺, in corundum 3=13300
 CuF₂·5HF·5H₂O, 9625 Mc/s meas. 3=5038
 CuSO₄·5H₂O, exchange amalgamation 3=20640
 CuSO₄·5H₂O, paramag. ions coexisting within ordered spin system 3=20644
 DO₂, from D₂O soln., 77°K, u.v. irradiated 3=20012
 Dy³⁺ in CaO, covalent bonding evidence 3=25576
 Dy³⁺ in YGa garnet lines 3=15937
 DyCl₃·6H₂O, 1.1-4.2°K, 2-2660 c/s 3=8719
 DyCl₃·6H₂O, spin-lattice relax. 1.1° to 4.2°K 3=3183
 Dy ethyl sulphate, spin-lattice relaxation 3=1194
 Er³⁺ in CaO, covalent bonding evidence 3=25576
 ErCl₃·6H₂O, 1-1-4.2°K, 2-2660 c/s 3=8719
 ErCl₃·6H₂O, spin-lattice relax. 1.1° to 4.2°K 3=3183
 Eu²⁺, in Nd ethyl sulphate, quadrupole h.f.s. 3=3173
 Fe-group ions in fluoride cryst., bonding 3=20043
 Fe-group ions in fluoride crystals, bonding study 3=15407
 Fe, in GaAs, meas. at 77°K 3=11113
 Fe relax. in K₃Co(CN)₆, freqn. depend. 3=25572
 Fe²⁺, in MgO, u.s. velocity near resonant absorption, by u.s. e.s.r. 3=6759
 Fe²⁺ in Al₂O₃, transition matrix elements, calc. 3=23230
 Fe²⁺, in Al₂O₃, 2-80°K, 3 cm 3=20649
 Fe²⁺, in andalusite, and isomorphism 3=20855
 Fe²⁺ in calcite 3=15940
 Fe²⁺ in CaO rel. to MgO, CaF₂ 3=3181
 Fe²⁺, in CdWO₄, and spin Hamiltonian 3=5040
 Fe²⁺, in corundum, temp. depend. 3=5039
 Fe²⁺ in guanidinium Al sulphate hexahydrate 3=8747
 Fe²⁺ in MgAl₂O₄ spinel 3=8711
 Fe²⁺, in natural MgAl₂O₄, at room temp. 3=25571
 Fe²⁺ in MgO, rel. to axial cryst. field 3=2695
 Fe²⁺, parameter D, rel. to axial crystal field 3=8336
 Fe²⁺, in ZnWO₄, spin-lattice relaxation 3=25569
 Fe(NH₄)₂(SO₄)₂·12H₂O, line-widths, g-factor 3=25565
 Ga³⁺ in LaAlO₃, 3=11112
 GaAs, centres, obs., in high concentrations 3=20647

Paramagnetic resonance and relaxation — contd

- Gd, g-shift, rel. to f-cond. electron coupling 3=8400
 Gd, resonance in Pd and Pd-rich alloys, effect of hydrogenation 3=15944
 Gd³⁺, in CaF₂, h.f.s. of resonance spectrum 3=15943
 Gd³⁺, in glasses 3=20651
 Gd³⁺ in Pd with rare earth impurities 3=8709
 GdCl₃·6H₂O, 1.1-4.2°K, 2-2660 c/s 3=8719
 GdCl₃·6H₂O, spin-lattice relax. 1.1° to 4.2°K 3=3183
 Ge, doped with P, rel. to stress 3=18131
 Ge, 136 k Mc/s absorption spectrum, rel. to valence band parameters 3=25577
 HO₂, from H₂O₂ soln., 77°K, u.v. irradiated 3=20012
 H₂O₂, solid, ΔM = 2 transitions, rel. to u.v. irradiat. 3=23229
 He³ liquid, relaxation, Fermi liquid model 3=14435
 Hg vapour, by transverse Faraday effect at Larmor freq. 3=23943
 Ho²⁺ in CaF₂ at 4.3°K 3=13301
 In¹¹⁴ spin relaxation in Fe alloy 3=2417
 InSb, electric dipole spin transitions 3=3175
 InSb, impurity electron states study 3=4911
 InSb, n-type, e.s.r. and cyclotron 3=18133
 K, soln. in NH₃, e.s.r., effect of adding KI 3=11811
 KBr, U₂-centre 3=10696
 KCl: Ag, X-irrad., trapped holes and electrons 3=5044
 KCl, colour centres 3=23234
 KCl, doped with KNO₃, X-irrad. 3=25573
 KCl, F-centre aggregation study 3=25302
 KCl, F-centres, with h.f. modulation of mag. field 3=15932
 KCl, F = F' reaction and F' lifetime study 3=2840
 KCl, with impurity valence changes 3=1180
 KCl, U₂-centre 3=10696
 KCl: Sr, Z-centres 3=25304
 K₂(Co,Fe)(CN)₆, spin-lattice relaxation 3=18140
 K₂CuCl₄·2H₂O, exchange amalgamation 3=20640
 K₃Fe(CN)₆, ferric ion exchange interaction 3=1054
 KI, I¹²⁷ quadrupolar spin-lattice relaxation time 3=18156
 K-NH₃ soln., decomposition study 3=3381
 K-liquid NH₃ solns., relaxation times 3=18834
 KNO₃, irradiated, NO₂ and NO₂⁻ resonance 3=11116
 K₂(SO₄)₂, aq. solns., electron spin exchange 3=16639
 K vanadyl oxalate, diluted single crystal 3=1189
 La³⁺, in CaF₂, 3=20650
 LaF₃, Nd³⁺ doped, hidden selection rule 3=20481
 Li, liquid, conduction e.s.r. 3=5450
 Li-liquid NH₃ solns., relaxation times 3=18834
 LiF, with impurity valence changes 3=1180
 LiF, neutron-irrad., F-centre study 3=11114
 LiN₃D₂SO₄, ferroelec., γ-irrad. 3=13302
 LiN₃H₂SO₄, ferroelec., γ-irrad. 3=13302
 Lu₃Al₅O₁₂, Nd³⁺, Dy³⁺, Er³⁺, Yb³⁺ substituted, g-value detm. 3=1052
 Lu₃Ga₅O₁₂, Nd³⁺, Dy³⁺, Er³⁺, Yb³⁺ substituted, g-value detm. 3=1052
 MgO, neutron irradiat., spin-lattice relaxn. of F-centres 3=817
 Mn, in GaAs at 77°K, meas. and theory 3=3177
 Mn and Gd impurities in BaF₂, 3=11111
 Mn in Pd, hyperfine structure 3=15945
 Mn ions, electric fields, effects 3=18126
 Mn²⁺ in CaCO₃, calc. 3=23231
 Mn²⁺ in CaO rel. to MgO, CaF₂ 3=3181
 Mn²⁺ in CdSe, rel. to covalency effects 3=11115
 Mn²⁺, in GaS 3=8713
 Mn²⁺, in glasses 3=20651
 Mn²⁺ in LiF 3=13303
 Mn²⁺ in MgAl₂O₄ spinel 3=8711
 Mn²⁺ in MgAl₂O₄ spinel, zero-field splitting 3=8712
 Mn²⁺ in MgO, additional biquadratic exchange term in spin Hamiltonian 3=20627
 Mn²⁺, in MgO, spin-lattice relax. 3=8724
 Mn²⁺, in SrS 3=5042
 Mn²⁺, in SrS, spin-lattice relax., theory 3=25562
 Mn²⁺ in II-VI cpds., rel. to lattice distortion 3=25167
 Mn²⁺ pairs in Mn, ZnF₂, exchange interaction 3=3176
 Mn⁴⁺ ions, effect of charge transfer levels 3=8705
 Mn acetate, sulphate, line-widths, g-factors 3=25566

Paramagnetic resonance and relaxation — contd

- Mn(H₂O)₆²⁺, in aqueous glass 3=6748
 Mo⁶⁺,⁵⁵ in MoCl₃ liquid and supercooled solns. 3=1711
 N, in NaN₃ after X-irrad., fine structure 3=25574
 N¹⁴, in di-sec-butyl nitric oxide 3=6353
 N¹⁴ h.f.s. in heterocyclic anions 3=8295
 (NH₄)₂(Cd)(SO₄)₂: Mn²⁺, temp. depend. 3=5043
 (NH₄)₂ Cu Cl₄·2H₂O, absorpt. abs. intensity 3=1185
 (NH₄)₂H₂P₂O₈, γ-irrad., defects 3=13022
 (NH₄)₂HPO₄, irrad., π-electron radical 3=11117
 NH(SO₃⁻) in γ-irrad. K sulphate 3=6417
 NO₂ radical, trapped 3=6418
 Na, colloidal in NaN₃, temp. depend. 3=3418
 Na, cond. electron susceptibility 3=1053
 Na, soln in NH₃, e.s.r., effect of adding NaI 3=11811
 Na vapour, optically pumped, shifted 3=12771
 Na—aromatic complex in soln., hyperfine splitting 3=25138
 NaCl, U₂-centre 3=10696
 Na—liquid NH₃ solns., relaxation times 3=18834
 Na₂O·B₂O₃·SiO₂ glass, radiation effect meas. 3=17795
 NaF, M-centre, paramagnetism question 3=819
 NaF with impurity valence changes 3=1180
 NaH, e.s.r., 1.2°K, 9200 Mc/s, and electron density 3=15947
 Na₂S₂O₃, γ-irrad., effect of dehydration 3=23236
 Nb⁴⁺ in ethanol glass 3=15946
 Nd³⁺ in dil. LaMg nitrate, spin—lattice relaxation time rel. to echo formation 3=1195
 NdCl₃·6H₂O, 1.1–4.2°K, 2–2660 c/s 3=8719
 NdCl₃·6H₂O, spin—lattice relax. 1.1° to 4.2°K 3=3183
 Nd ethylsulphate, spin levels saturation 3=8714
 Ni ions in alumina 3=23232
 Ni ions in double-nitrate crystals 3=6749
 Ni²⁺, in AgBr, AgCl, liquid H temps. 3=13307
 Ni²⁺ in CaO rel. to MgO, CaF₂ 3=3181
 Ni²⁺, in MgO, u.s. velocity near resonant absorption, by u.s. e.s.r. 3=6759
 Ni²⁺ ions, effect of charge transfer levels 3=8705
 NiX₂·6NH₃, (X = Cl, Br, I) f.c.c., e.s.r. linewidths 3=1188
 O¹⁷, in di-sec-butyl nitric oxide 3=6353
 O₂-radical substituting for halogen ion rel. to paraelasticity 3=1219
 OD, from D₂O₂ soln., 77°K, u.v. irradiated 3=20012
 OH, from H₂O₂ soln., 77°K, u.v. irradiated 3=20012
 PF₄ in NH₄PF₆, rel. to γ-irrad. 3=20652
 Pr³⁺ in dil. LaMg nitrate, spin—lattice relaxation time rel. to echo formation 3=1195
 Rb atoms, polarized, mag. relaxation at paraffin-covered walls 3=25060
 RbBr, F-centres, e.s.r. and ENDOR 3=15520
 RbCl, F-centres, e.s.r. and ENDOR 3=15520
 S, purple, annealing study 3=20655
 S-state ions, parameter D, rel. to axial crystal field 3=8336
 S, sublimated 3=1191
 S₂, liquid, e.s.r., and polymer chains, length 3=14155
 SH, absorption and spectrum, for radioastronomy 3=19988
 Si, donor electron spin—lattice relaxation 3=23244
 Si, impurity electron states study 3=4911
 Si, n-type, paramag. centre 3=6750
 Si, neutron irrad., centres study 3=2849
 Si, 136 kMc/s absorption spectrum, rel. to valence band parameters 3=25577
 Si, rel. to lattice vacancies 3=22734
 Si, surface centres prod. by heat treatment 3=5045
 SiF₄, γ-irradiated at low temp. 3=12874
 Sr, in KCl, F centres 3=23235
 SrTiO₃ + (ZrO₂, MgO), paramagnetic particles 3=15935
 Ti³⁺ in alcohol and glycerol 3=1712
 Ti³⁺, in corundum, spectrum and spin—lattice relaxation, theory 3=23237
 Ti³⁺ e.s.r. in glasses, rel. to glass structure 3=3179
 Ti (III) acetylacetonate 3=8715
 TiO_{1-x}—TiO₂ system, e.s.r. 3=3178
 TiO₂ (x = 1.5–2.0), temp. depend. 3=15949
 Tu³⁺ in CaF₂, 9250 Mc/s, 4.2°–60°K 3=18134
 U³⁺, in CaF₂, orthorhombic spectrum 3=20658
 U⁴⁺ in CaF₂, SrF₂ and BaF₂ 3=3180
 V²⁺ in CaO rel. to MgO, CaF₂ 3=3181
 V³⁺, in corundum, mag. suscept. 3=20548

Paramagnetic resonance and relaxation — contd

- V³⁺ ions, in Al₂O₃ (corundum), hyperfine transitions, calc., temp. effects 3=20659
 VOCl₂ aqueous solution, line shape rel to cons. and temp. 3=150
 VOCl₂, dil. soln. hyperfine line width 3=5451
 V₂O₅, partially reduced crystals 3=15950
 W^{180–184, 186}, in WCl₆ solns., liquid and super-cooled 3=21407
 W⁵⁺ in glasses, silicate and phosphate 3=20656
 XeF, radical, in γ-irradiated XeF₄, e.s.r. spectrum 3=25136
 Y²⁺(4d¹) in CaF₂ 3=15516
 Yb³⁺, in CaO, covalent bonding evidence 3=25576
 Yb³⁺ in CdF₂, spin—lattice, 2–77°K 3=18138
 Yb³⁺ in Y₂O₃ 3=18135
 ZnCdS phosphors, trapped electrons 3=23238
 ZnO, donors and acceptors 3=13309
 ZnO, photo-induced 3=6751
 ZnS phosphors, luminescent centres and traps 3=23112
 ZnS:Al, luminescent centre 3=8717
 ZnS:Ga phosphors 3=23131
 Zn Te: Mn, 3a field splittings 3=1192
 Zr³⁺ in glass, 450–9320 Mc/s, 77°–295°K 3=20660
 ZrSiO₄, zircon, 3=23239

measurement

- apparatus for pressures to 60 kbars and beyond 3=24492
 betatron time-varying fields meas. 3=4279
 cavity, variable-band, for X-band spectrometer 3=9959
 crystals, ionic, spin—lattice relax., low-temp. 3=25578
 cyclohexadienyl radical, h.f.s., hyperconjugation mechanism 3=22591
 difference spectra recording 3=17064
 heterodyne spectrometer, with homodyne detection 3=19468
 interpretation, commercial unit 3=24493
 magnetic fields, low, for teaching 3=5807
 maser, NH₃, as pre-amplifier 3=21991
 matrix element tables for operators O₄^{±1}, O₄^{±1}, O₆^{±5} 3=18691
 microwave and elec. components for anisotropy studies 3=25565
 optical double resonance method 3=24490
 radio spectroscopy, max. sensitivity 3=21992
 relaxation time, by lateral frequency modulation band obs. 3=24491
 review of modern spectrometers 3=24488
 sample holder for meas. during X-ray irrad. 3=4280
 sensitivity in transmission and reflection-cavity type spectrometers 3=14786
 signal shapes distortion by finite modulation ampls. 3=2138
 spectrometer, pulse, superheterodyne 3=7725
 spectrometer with h.f. field modulation 3=14788
 spectrometers 3=21986
 spectrometers, e.s.r., for solutions, aqueous, sensitivity 3=17063

Paramagnetism

- See also Magnetic properties of substances, paramagnetic.
 alloys, binary, theory rel. to short range order 3=3085
 collective, rel. to chemisorption 3=20995
 conversion to ferromagnetism by strong fields, collective electron theory 3=5004
 crystal lattice mechanics, spin—spin nuclear interaction, by virtual phonons 3=17648
 crystals, inhomogeneous, spin—lattice interact. 3=17647
 Curie point, difference with ferromag. Curie point 3=1127
 diatomic molecules, susceptibility calc. 3=10494
 electron gas, free, using free energy 3=3769
 electron gas in lattice of positive charges 3=8381
 ferrimagnetic and antiferromag. systems 3=20562
 heat capacity of spin system, exper. test of Van Vleck's formula 3=22665
 ion spin Hamiltonian parameters, calc., from reson. spectra 3=18127
 magnetic interactions between atoms, review 3=3090
 metals, electron spin, electron interact. effect 3=15756
 neutron critical and mag. scatt. 3=986
 neutron scattering by paramagnetic spin system 3=6695
 neutron scattering in paramagnetics, spin—spin interaction 3=6694

Paramagnetism — contd

- particle motion in a fluid in a magnetic field 3=17036
- phonon coherent paramag. diffusion in paramag. crystal 3=10585
- rotation of polarization plane of sound in paramagnetic 3=2724
- and rotatory dispersion 3=19971
- saturation, considering interatomic coupling 3=5001
- semiconductors with nonparabolic bands 3=23139
- solutions, n.m.r. 3=21413
- superconductors, energy gap, meaning 3=14439
- transition metal salts, superexchange model 3=11032

Parity

See also under individual particles, e.g. Mesons, spin and parity.

- Adair spin analysis with parity nonconservation 3=2229
- CPT theorem, rel. to K^0 -meson props. 3=10010
- conservation in baryon strong interactions 3=5932
- conservation in strong decay $\Sigma^0 \rightarrow \Lambda + \gamma$ 3=22213
- e.m. interactions, rel. to Dirac monopole 3=22054
- KAN 3=7929
- K-Y, from K^+ -N scatt. theory 3=24795
- magnetic monopoles, parity violation 3=21205
- S-matrix theory, intrinsic parity 3=2218
- weak interactions, non-conservation 3=17192
- weak interactions, rel. to elementary particles internal structure 3=24623
- Ξ -nucleon 3=19552

Particle accelerators

See also Ion beams.

- beam current meas., by integrator, digital 3=19138
- beam transport, magnet optimization, computer programme 3=16986
- bibliography 3=12098
- charged particle bunches, elec. fields 3=24379
- charged particles, acceleration possibility by e.m. waves in const. mag. field 3=2091
- circuits, instrumentation, transistorized 3=24178
- collimator slit scattering, calc. 3=5719
- current of beam, meas. using mag. pickup probe 3=446
- cyclotron, Berkeley 88 in., beam-transport system 3=5791
- cyclotron, Berkeley 88 in., 100-200 μ A external beam 3=5732
- cyclotron, 3-sector, electric gap-crossing resonance 3=5761
- cyclotron vacuum tank, primary nuclear reactions, study 3=10321
- electron beam current integrator 3=14650
- electron, beam effect on accelerating system 3=19376
- electron optics, mag., momentum defining non-interacting slit 3=19377
- electron and positron storage rings 3=12267
- electron, shielding 3=455
- electrons, radiation damping, theory 3=24394
- focusing magnet pole faces, ideal 3=24396
- handbook 3=2146
- high-energy; conference, July 1962 3=527
- ideal pole faces, weak, strong, FFAG-focusing 3=9881
- instrumentation conference, Geneva (1962) 3=12363
- magnetic field distrib., weak, strong, FFAG-focusing 3=9880
- particle bunches, phase oscill., induced voltage effects 3=24397
- polar surface, ideal 3=21898
- Rutherford Laboratory's two accel., use by universities 3=24393
- separator, electrostatic 3=19390
- signal electrodes, design and construction 3=5726
- storage systems, high currents, phase conditions 3=12277
- synchrocyclotron, annular particle motion 3=9889
- synchrotrons, proton, high energy, review 3=19389
- target, liquid hydrogen and deuterium 3=14688
- target potential modulation 3=12265
- target of T_1 or D_1 -saturated Zr, temp. distrib. 3=24395
- weak secondary beams, system for detectn., focusing 3=2179

linear

- beam extraction, 1 GeV, three-magnet system 3=16997
- Brookhaven Conference (1962) 3=7662

Particle accelerators — contd

linear — contd

- buncher, beam current loading 3=14689
 - cascade, stabilizer, 2 MV protons 3=24415
 - Cockcroft-Walton machine, voltage stabilizer 3=9882
 - Cockcroft-Walton, 200 kV, ion optical system 3=19382
 - d.c. methods, recent advances 3=24400
 - electron accelerator, energy and phase characteristics, wave phase vel. equal to light vel. 3=21908
 - electron, beam current meas. 3=9883
 - electron, beam position monitor 3=5728
 - electron current pulse monitor 3=24401
 - electron, Harwell, 10 nsec. bursts 3=19655
 - electron microwave accelerator 3=19380
 - electron, parameter choice criteria 3=16996
 - electron, pulse shortening, E_{11} fields in iris-loaded guides 3=19379
 - electron, Stanford, 3 km, 45 GeV 3=5729
 - electron, 30 MeV, for neutron spectroscopy 3=5727
 - e.s. belt, short circuit current in transport, calc. 3=21910
 - electrostatic, electron optics, expts. 3=16984
 - electrostatic, 2.5 MeV, for production of H and He ions 3=21909
 - 15 MeV machine, 50 mA beam pulse current 3=19385
 - focusing, alternate, by crossed-gradient fields 3=24399
 - focusing by accelerating field 3=24402
 - inclined field tubes, ion path 3=14690
 - ion source, 150 kV, giving 1 mA 3=19386
 - ions, electrostatic, axially symmetric 3=12266
 - ions, mean energy meas., optical meas. 3=24384
 - for $K\pi$ separation, 4 GeV/c, r.f. 3=19381
 - neutron generator, 14 and 2.5 MeV 3=2286
 - pre-buncher, resonator type 3=12268
 - protons, high-freq; concentric high Q Lecher line 3=458
 - Rensselaer Polytechnic Institute linac 3=2057
 - source of polarized protons 3=24732
 - targets, low-temp., liquid hydrogen or deuterium 3=24531
 - 2 MeV electrostatic, terminal electronic circuits 3=16995
 - Van de Graaff beam, as atomic emission spectrum source 3=19918
 - Van de Graaff beam deflecting system 3=456
 - van de Graaff, belt, charge meas. 3=19384
 - van de Graaff, charging, theory 3=19383
 - Van de Graaff, electron gun, optical analysis 3=7644
 - Van de Graaff, heavy-ion energy accumulation 3=21907
 - van de Graaff, instrumentation circuits 3=24178
 - Van de Graaff, "inverted cone" tubes, performance 3=9885
 - Van de Graaff MP-II tandem, probing of nuclear structure 3=22268
 - Van de Graaff, nsec pulsed, high intensity 3=4223
 - van de Graaff, stabilization of ion beam energy, 4 MeV 3=19378
 - Van de Graaff type model VC-3, characteristics 3=4224
 - Van der Graaff, 3 MeV, energy resolution 3=457
 - voltage breakdown prevention by inclined fields 3=9884
- orbital**
- accelerating system, choice of freqn. 3=21911
 - betatron, beam storage method 3=12276
 - betatron, bremsstrahlung production 3=5983
 - betatron, cylindrical, cont. no steel and using axial mag. focusing 3=14698
 - betatron, efficiency 3=21915
 - betatron, electron injector 3=7664
 - betatron, electron loss by scatt., expt. 3=459
 - betatron, energy imprecision reduction by internal target 3=24408
 - betatron, expander, power supply circuit 3=14480
 - betatron field parameters calc. 3=2066
 - betatron, gamma-ray intensity rel. to injector focusing 3=24417
 - betatron with H-type magnet, field inhomogeneities 3=7663
 - betatron, irradi. inside accel. chamber 3=14701
 - betatron, magnet excitation, stabilization, ferro-resonant 3=12274
 - betatron, magnetic circuit technology 3=17009
 - betatron oscillations in nonlinear mag. field 3=14699
 - betatron oscillations, nonlinear, theory 3=9892

Particle accelerators — contd

orbital — contd

- betatron radiation, var. with injection voltage 3=17007
 betatron and synchrotron electron oscills. 3=5798
 betatron, time-varying fields, e.s.r. meas. 3=4279
 betatron, 23 MeV, energy control calibration 3=4226
 betatrons, orbit, equilibrium meas. 3=19388
 Coulomb scatt., multiple, particle loss 3=9881
 cyclic, phase stability 3=2060
 cyclotron, accel. voltage stabilizer 3=14694
 cyclotron, adjustment when accelerating ions 3=4228
 cyclotron, Analogue II, beam characteristics 3=5782
 cyclotron, Analogue II, tune-up 3=5783
 cyclotron, AVF, mag. field measurement 3=5767
 cyclotron, AVF, motion of ions 3=5758
 cyclotron, AVF, orbits invest. by analogue computer 3=5768
 cyclotron, with azimuth varying mag. field 3=9888
 cyclotron beam, mag. deflection, sector, three different directions 3=21916
 cyclotron, Berkeley 88 in., beam phase meas. 3=5792
 cyclotron, Berkeley 88 in., central mag. cone 3=5772
 cyclotron, Berkeley 88 in., centre-region geometry 3=5771
 cyclotron, Berkeley 88 in., computer codes for trim-coil currents 3=5766
 cyclotron, Berkeley 88 in., electrostatic deflection calcs. 3=5788
 cyclotron, Berkeley 88 in., ion source 3=5790
 cyclotron, Berkeley 88 in., ion-source mechanism 3=5789
 cyclotron, Berkeley 88 in., mag. fields meas. 3=5750
 cyclotron, Berkeley 88 in., r.f. system 3=5755
 cyclotron, Colorado 52 in., internal beam prodn. 3=5735
 cyclotron, Colorado 52 in., magnet and spiral shim design 3=5749
 cyclotron, Colorado, negative H ions acqn., extraction 3=5736
 cyclotron, constant freq. sector-focused, for 450 MeV protons 3=5777
 cyclotron, dee voltage stabilizer 3=2058
 cyclotron, deflector voltage stabilizer 3=14695
 cyclotrons, duty cycle improvements 3=5795
 cyclotron, 88 in., spill beam 3=5733
 cyclotron, elec. accel. field, phasing effect 3=9890
 cyclotrons, emerging ion beam meas. 3=2061
 cyclotron, gas entrainment recoil target assembly 3=2064
 cyclotron, internal beam phase meas. 3=5793
 cyclotron, ion bunches, length and repetition 3=2063
 cyclotron, ion motion in central zone, calc. 3=21914
 cyclotron, ion source, hooded arc, variable yield 3=17008
 cyclotron, ion source, inverse magnetron type 3=2043
 cyclotron, isochronous, duty factor increase 3=5794
 cyclotron, isochronous, as meson factory 3=5778
 cyclotron, isochronous, sector-focused, shimming 3=5739
 cyclotrons, isochronous, tabulated 3=5748
 cyclotron, isochronous 3-sector, accelerated orbits in central region 3=5774
 cyclotrons for large π and μ meson fluxes 3=5781
 cyclotron, mag. field intensity, shape control 3=21913
 cyclotron, Manitoba, shaping of mag. field 3=5745
 cyclotron, Mc⁺ type, for protons, π and μ mesons 3=5779
 cyclotron, Michigan 83 in., design 3=5741-4
 cyclotron, MSU, computer programmes 3=5770
 cyclotron, Oak Ridge, isochronous, first month's operation 3=5734
 cyclotron, ORNL 86 in., high voltage regulation 3=5757
 cyclotron, 184 in., radiation survey 3=5784
 cyclotron orbits calc., computer programmes 3=5763
 cyclotron oscillator, magnet power supplies, use of Si diodes 3=5796
 cyclotron, radial-ridge, at Birmingham, linear regenerative extraction 3=5785
 cyclotron, radial ridge, 40 in., for 12 MeV deuterons 3=5731
 cyclotron, relativistic, nonlinear resonances 3=12273
 cyclotron, relativistic, for University of Milan 3=5738
 cyclotron, resonance system, γ -rays meas. 3=24419
 cyclotrons, sector-focused, conference, Los Angeles (1962) 3=4227
 cyclotron, 70 in., design for protons up to 50 MeV 3=5746
 cyclotron, spiral ridge fields, particle motion 3=4225
 cyclotron, spiral ridge, for 450 MeV protons 3=5780
 cyclotron, spiral ridge, Illinois, beam extraction 3=5787

Particle accelerators — contd

orbital — contd

- cyclotron, spiral ridge, 70 in., magnet design 3=5751
 cyclotron, spiral ridge, 22 in., Davis, California 3=5747
 cyclotron, spiral-ridge, UCLA, 50 MeV, beam intensity, tuning 3=5730
 cyclotrons, synchrocyclotrons, elec. dissociation of negative H ions 3=5737
 cyclotron, 3-sector low-spiral, resonant extraction 3=5786
 cyclotron, 3-sector, radial stability, effect of field imperfs. 3=5760
 cyclotron trim-coil currents, calc., linear programming methods 3=5765-6
 cyclotron, UCLA, r.f. system 3=5754
 cyclotron, variable energy, multiparticle, central orbit programme 3=5773
 cyclotron, variable-energy, new oscillator 3=5836
 cylindrical, space charge-r.f. field interact. 3=24418
 deflector, electromagnetic, for particle introduction 3=17010
 electron capture processes 3=17006
 electron synchrotron, Inst. Nuc. Studies, Tokyo 3=460
 electrons, acceleration in annular phasotron 3=24403
 electrons, induction acceleration in annular phasotron 3=24404
 FFAG, geometrically similar orbits 3=12269
 fixed-frequency, fixed-field, high-energy 3=24411
 fixed-point orbits associated with sector resonances 3=5762
 Harwell synchro-cyclotron, duty cycle extension 3=24410
 loss, particle, calc., Kramers and hypergeometric series methods compared 3=12270
 as meson factories, comparison of types 3=5775
 meson factory, shielding and activations 3=5776
 microtron, effect of inhomog. mag. field 3=24414
 microtron electron accel., review 3=14693
 microtron, electron bunches 3=24413
 microtron, electron bunch radiation 3=5800
 microtrons, electron packets, charge density 3=4229
 microtron, as pulsed source, for n spectrometry, time-of-flight 3=22139
 microtron, tuned focused cathode arrangement 3=24412
 microtron, vertical focusing 3=5799
 modulation by random fluctuations 3=14697
 orbit stability, computer programme 3=5769
 ORIC mag. fields design, computer programmes 3=5764
 ORIC, mag. field design, measurement 3=5752
 ORIC, magnet regulators 3=5753
 phasotron, annular, acceleration of electrons 3=24403
 phasotron, annular, induction acceleration of electrons 3=24404
 phasotron, ring-shaped, spiral field distrib. 3=9887
 Philips AVF prototype, design features 3=5740
 proton synchrotron, 10 GeV, beam-target interact. time, variation 3=24416
 proton synchrotron, 12 BeV, voltage programming 3=24409
 pion factory, role in elementary particle physics 3=7886
 saturation effects, self correction 3=24398
 sector-focused, betatronic stability, isochronism 3=5759
 self-correction principle, mag. field, appl. 3=7666
 Stellarator, charged-particle motion, stability 3=2065
 storage ring, lifetime and beam size 3=17005
 storage rings, proton, colliding beam, for synchrotron 3=17003
 strong focusing, injection energy decrease 3=16998
 synchrocyclotrons, beam extraction methods 3=21917
 synchrocyclotron, debunching of beam pulse 3=12271
 synchrocyclotron, Harwell, beam stacking 3=12272
 synchrocyclotron, internal beam current meas. 3=14700
 synchrocyclotron, pulse circuit for oscillator 3=2059
 synchro cyclotron, ring-type, h.f. free oscillations 3=24405
 synchrocyclotron, variable-energy, compared to sector-focused cyclotron 3=5756
 synchrotron, alternating gradient, K-meson separator, 2.3 GeV/c 3=17000
 synchrotron, alternating gradient proton, antiproton separator 3=16999

Particle accelerators — contd

orbital — contd

- synchrotron, beam shaping, by Cu induction electrodes 3=19387
- synchrotron, bremsstrahlung, polarized by crystal, on electron impact 3=5980
- p-synchrotron, CERN, prod., of high-energy neutrinos 3=17243
- p-synchrotron, CERN, prod. of K, 800 MeV/c, focusing 3=17333
- synchrotrons, electron clusters, axial and radial variation 3=4193
- synchrotron, electron, 1100 MeV, at Frascati, Italy 3=21912
- synchrontron, electron, with toroidal waveguide 3=9886
- synchrotron injection, e.m. inflector 3=12279
- synchrotron, magnet excitation, stabilization, ferromagnetic 3=11274
- synchrotron, proton, K-meson separator, 1.5 GeV/c 3=17001
- synchrotron, proton, ring-shaped 3=7665
- synchrotron, proton secondary beam, small angle, variable momentum 3=17002
- synchrotron, proton, 7 GeV 3=12275
- synchrotron, proton, 10 GeV, proton beam 3=7667
- synchrotron, 100 MeV electron, Turin 3=4623
- synchrotron, proton, 300-1000 GeV, experimental techniques 3=17004
- synchrotron, special operation mode, electron bunch size 3=5797
- synchrotrons and storage rings, space charge influence 3=24406-7
- target, H-D, liquid 3=14692
- trajectories, generalization of eqn. for phase 3=14691
- vertically increasing field 3=12278
- waveguide, irised, beam stability 3=14696

Particle detectors

- See also Bubble chambers; Cloud chambers; Counters; Ionization chambers; Nuclear track emulsions; Particle chamber, secondary electron monitor foil, stability 3=17112
- cosmic rays, absorption spectrometer for GeV region 3=24813
- by exo-electron emission 3=12229
- high-energy; conference Geneva, July 1962 3=527
- four-counter telescope for stopping particles 3=24754
- Li drift, high-energy 3=17114
- multidetector array, method of use 3=5610
- multiparameter analysers 3=24187
- neutrons, thermal, photographic detectors 3=12477
- nuclear instruments symposium 3=12364
- photodetectors, u.v., description 3=7337
- photomultiplier, for mag. analyzers 3=19508
- scanning efficiency estimation 3=9998
- secondary electron monitor foil chambers, stability 3=17112
- semiconductor, Si junction 3=529
- semiconductor, time characts. 3=22040
- sensitivity criterion for detector selection 3=9997
- p-silicon, lithium, n-i-p 3=14630
- Si, n-type, for charged heavy particles 3=2166
- statistics, use of generating probab. functions 3=14833
- transistor probe unit 3=4287

Particle focusing

See Particle optics.

Particle optics

See also Electron optics; Ion optics.

- accelerator, synchrotron, alternating gradient proton, antiproton separator 3=16999
- accelerator, synchrotron, proton, K-meson separator, 1.5 GeV/c 3=17001
- accelerator, synchrotron, proton, secondary beam, small angle, variable momentum 3=17002
- axially symmetric mag. field focusing effects 3=9875
- beam deflecting system for Van de Graaff accel. 3=456
- beam transport systems, symmetry props. 3=24381
- charged, focusing props. of long mag. lenses 3=14673-4
- charged-particle beams 3=12256
- charged particle beams in mag. channel 3=14670

Particle optics — contd

- charged particle bunches, elec. fields 3=24379
- charged particle motion in uniform mag. fld. increasing linearly with time 3=2092
- cyclotron beam, mag. deflection, sector, three different directions 3=21916
- double focusing in wide energy intervals 3=4220
- focusing by accel. field of linear accelerator 3=24402
- focusing, detectn. of weak charged particle beams 3=2179
- focusing, quadrupole magnets, design and calc. 3=447
- injection of high-velocity particles into strong mag. fields 3=14653
- lens, magneto-electric quadrupole, spherical aberration 3=19368
- magnet optimization, computer programme 3=16986
- magnetic lens, long, focusing properties, Monte Carlo method 3=19342
- magnetic mirror effect, demonstration 3=4194
- molecular NH₃ beam focusing, ring and helical electrodes, for maser 3=16987
- paraxial trajectories in presence of space charge 3=9856
- polar surface, ideal 3=21898
- quadrupole lens focusing and transmission, calc., graphical 3=19369
- quadrupole lenses, pole shape 3=14671
- relativistic beam propagation in electrostatic fields 3=21895
- separator, electrostatic, high-energy 3=19390
- spectrograph for heavy particles 3=24383
- in weak, strong and FFAG-focusing instruments 3=9880

Particle range

- α -rays, range-energy meas., 5-30 MeV 3=24812
- atoms, energetic in crystal lattices 3=22879
- atoms, energetic, in solids 3=8462
- atoms, energetic, in solids 3=10571
- charged particles in Si 3=17113
- deep penetration, general theory 3=5711
- electrons, 10-80 keV, penetration depth in phosphors 3=10701
- heavy charged parts., range-energy relation 3=7818
- heavy-ions, by analysis of α -line shapes 3=14677
- inert gas ions in metals, keV, corrections, due to sticking and saturation 3=19373
- multicharged ions in solids and gases 3=5722
- optimum conditions, rel. to Beer's law 3=24041
- in solids, from sputtering yield 3=5721
- tritons, in polystyrene, N₂, air, Al, Ar, Ni, Kr, Xe 3=10180
- Ar⁴¹, in Al, 0.7 keV-2.25 MeV 3=19372
- Ar ions, in H₂, N₂ and Ar, at < 10 MeV/a.m.u. 3=1937
- Ar⁴¹ ions, in W, keV energies 3=22878
- Be⁹ ions, in Al and Au, at 2-21 MeV 3=2048
- C ions, in H₂, N₂, CH₄, Ar and He, at < 10 MeV/a.m.u. 3=1937
- H⁺ and He ions, in Si 3=10708
- H¹, in C, Al₂O₃, VYNS films, energy loss 3=4394
- He ions, in H₂, N₂ and Ar, at < 10 MeV/a.m.u. 3=1937
- He⁴, in C, Al₂O₃, VYNS films, energy loss 3=4394
- Kr, 10-150 keV, in Cu, high-values perpendicular to (110), due to focussing 3=20251
- Kr⁸⁵ ions in Al channelling events 3=15521
- Kr⁸⁵ ions in Al, W, 2-600 keV 3=14675
- Kr⁸⁵ ions, in WO₃, 40 keV 3=22878
- Mg²⁷, in Al, from Al²⁷(n,p) 3=6270
- N ions in Au, 0.4-6.4 MeV 3=4211
- Na²⁴, in Al, range-energy curve 3=4640
- Na²⁴ ions, keV energies, range in Al 3=24385
- Ne²², in Al, 1-3 MeV 3=4640
- Rn²²² ions, by analysis of α -line shapes 3=14677
- Rn²²² ions, 2-450 keV, in Al and W. 3=14678
- W¹⁸⁷ ions in W, 1.6-127 keV 3=14678
- Xe¹³³, in Al, 0.5-240 keV 3=19372
- Xe¹³³ ions, in W, keV energies 3=22878

Particle size

See also Surface measurement.

- aerosols, from diffusion decay meas. 3=13625
- aerosols, natural, meas. technique 3=13691
- in aerosols, hydrosols, flow-ultramicroscopic method 3=3415
- atmospheric aerosols 3=11416

Particle size — contd

- centrifugal analyser for 0.1-5 μ 3=8981
- centrifugal classifier for 4-30 μ 3=8980
- diamond powder, analysis, comparison of methods 3=23825
- distribution Cu powders 3=13552
- dust, airborne, surface area, light and electron microscope 3=18461
- dust, mine, by microscope, use of χ^2 test 3=14688
- interplanetary and interstellar matter, meas. 3=7019
- irregular, area meas., various methods 3=1651
- liquid sprays, analysis by sedimentation 3=11363
- micromeritics, statistical technique 3=6934
- powders, distrib. 1-40 μ , using photosedimentograph 3=16570
- rubber latex, distrib., from turbidity meas. 3=6931
- in solids, meas. 3=23367
- steel, Fe, cast, effect of cold pressing, by X-rays, reflection 3=18401
- sub-sieve sizing, by sedimentation balance 3=21278
- X-ray reflection meas. 3=18401
- Ag halide dispersions, change with time. 3=25839
- Ba ferrite powders, effect of particle size on coercive force 3=15879
- Fe, cast, steel, effect of cold pressing, by X-rays, reflection 3=18401
- NaCl aerosol, size variation 3=13626
- Pt-Al₂O₃ catalyst, 300° to 1300°C 3=18367
- Sn crystallites on SiO films 3=18380

Particle spectrometers

- See also Alpha-ray spectrometers, etc.
- amplitude-to-time converter, transistorized 3=19148
- analyser-multispectrograph, mag. multiangular 3=531
- compensation of earth's mag. field 3=19399
- electrostatic-prism energy analyser 3=4209
- field emission 3=5691
- focusing magnetic fields, parameters 3=19598
- ideal pole faces, weak, strong, FFAG-focusing 3=9881
- magnetic, axially symm. fields, focusing 3=9875
- magnetic, characteristics calc., matrix method 3=7652
- magnetic field distrib., weak, strong, FFAG-focusing 3=9880
- multiple-gap mag. spectrograph, charged particles 3=9871
- NaI:Ti, use for abs. standardization 3=17111
- π^- -meson star spectrograph 3=17327
- π , spark chambers, mag. 3=17326
- semiconductor (Ge,Si) 3=7748
- spectrograph for heavy particles 3=24383
- spectrometer, automatic single-channel 3=15126
- wide-band, with double focusing 3=19500

Particle track visualization

- See also Bubble chambers; Cloud chambers; Luminescence chambers; Nuclear track emulsions.
- AgCl crystals, applic. to 1.55 BeV proton reactions 3=5906
- inside AgCl large crystals, distortion-free 3=7754
- analogue recognition 3=19516
- computer programme for kinematic analysis 3=19517
- demonstration apparatus 3=3703
- emulsion chambers, effect of hydrogenous impregnation 3=24571
- Enetra 110, comparator-type apparatus 3=4305-6
- fission fragments in UO₂ films 3=822
- fission tracks in AgCl crystals 3=821
- gas discharge avalanche, delineating 3=19532
- in gas mixture in waveguide 3=17155
- gaseous discharge chamber 3=2182
- Hough-Powell analysis realization 3=24561
- Hough-Powell flying spot digitizater program 3=24562
- handbook 3=2146
- hodoscope, using ferrite-transistor elements 3=1916
- luminous discharges in ionized bubbles injected into a liquid 3=19537
- measurement, hand and automatic, punched tape 3=17120
- in mica, fission, use in radioactive dating 3=5907
- mica, fossil U fission tracks 3=6948
- neutron, selective fission fragments, for dosimeter, slow and fast 3=24752
- nuclear emulsion multiple scattering calculation 3=7752
- silicate minerals, use 3=2843

Particle tracks

- See also Particle range.
- brightness rel. to ionization density in spark chamber 3=19525
- bubble chambers, distortion due to bubble rise 3=2177
- bubble density meas. 3=14835
- charge determination, relativistic particles in emulsion 3=14841
- depth gauge for nuclear emulsions 3=2181
- energy estimation from, limitations on accuracy 3=24568
- in emulsion, momentum meas., high energy particles 3=12378
- in emulsions, multiple scattering, from sums of second differences of trajectory arrows 3=7753
- emulsion, particle identification by photometric device 3=24573
- in emulsion, profile meas. 3=534
- in glass, obs. of damage tracks 3=2850
- granularity, semi-automatic meas. 3=19536
- He⁹, from T-shaped track due to 9 BeV proton reaction 3=4475
- mica, charged particles, electron micr. study 3=2842
- multiple detector systems 3=19515
- neutrons, in silicon, electron micr. exam. 3=15524
- nuclear emulsions, momentum meas., high energy diffusion separation 3=24668
- PbI₂, fission-fragment tracks 3=25306
- solids, charged particle tracks, etching 3=2843

Particle velocity analysis

- See also Alpha-ray spectrometers; Beta-ray spectrometers; Ion velocity; Mass spectrometers; Particle range
- Cherenkov ring measurement 3=24554
- cosmic rays at mountain altitudes 3=7956
- electron stream, multi-velocity 3=14651
- electrostatic-prism spectrometer 3=4209
- group theory, invariant operators, Casimir type 3=3707
- ion energy analyser, up to thousands of eV 3=7588
- ion velocity gauge, absolute, testing 3=22381
- ions, mean energy meas., optical meas. 3=24384
- molecular beams, mechanical selector 3=15398
- molecules evaporating from chamber 3=15399
- momentum meas. by single-gap spark chamber 3=17150
- momenta meas., ~ 24 GeV/c, with emulsions 3=12378
- neutrons, phased chopper vel. selectors 3=4408
- pulse spectrometry, statistics 3=14833
- simultaneous meas. of several spectra 3=1922
- velocity selector, image force 3=4379
- Cu, cathode sputtering, rel. to focusing energies 3=25315

Particles

- See Fundamental particles; Particle range; Scattering, particles; and under individual particles, e.g. Protons and antiprotons.

Pendulums

- amplification, travelling wave, analogue demonstration 3=21191
- earth vibrations effects 3=23562
- energy transfer from a.c. field 3=19403
- Lorentz's problem of shortening thread 3=11744
- vertical ballistic pendulum apparatus 3=23819

Periodic system

- See also Elements.
- isoelectronic series, constant energy differences 3=22472
- and melting points, transition metals, and Tc 3=7386
- rel. to Thomas-Fermi atom, electron scattering, elastic, low-energy 3=12774
- transuranic group, subdivision 3=12748

Permeability, magnetic

- See Magnetic properties of substances; Magnetization process.

Permeability, mechanical

- See also Diffusion in solids.
- anomalous polymer-penetrant permeation 3=1679
- ferrites, complex, meas., by coaxial resonator, 10-1000 Mc/s 3=17017
- flow of adsorbable gases and vapours in microporous medium 3=3823-4
- gases, in membranes monolayer 3=5461
- membrane, with mixed boundary conditions 3=5418
- porous materials; Marshall method 3=18369
- quartz, to H and D 3=8452
- Ag to oxygen 3=13549

Permeability, mechanical — contd

- H₂ and D₂, through Fe, rates 3=22815
- H₂, in Fe-Ni alloys, rel. to work hardening 3=18344
- He gas through glass 3=2826
- Xe, in UC powder 3=2834

Permittivity

See Dielectric properties of substances.

Phase equilibrium

See also Solubility; Solutions.

- co-existence curve and compressibility curve near critical point 3=3786
- crystalline-liquid phases, texture 3=24107
- diamond/graphite/liquid, triple point 3=8793
- graphite/diamond/liquid, triple point 3=9656
- interphase surface, surface tension 3=11198
- liquid-liquid phase boundaries, rel. to coalescence of 2 Hg hemispheres 3=23865-6
- naphthalene, solid-vapour, effect of inert gases at high press 3=304
- solid-vapour and liq.-vapour, isotope effects 3=21611
- ternary system S1/S2/L0, isothermal data, calc. 3=20983
- III-V compounds 3=11199
- III-V melts 3=25815
- Al-Ag 3=8886
- Al-Zn 3=8886
- Au-Cd alloys, α , α_2 and β' phases 3=6855
- Au-Ni 3=8886
- Bi-Se system, monotectic reaction 3=16107
- Bi₂O₃-Nb₂O₅ systems meas. 3=6813
- CdSe-CdCl₂ system 3=13590
- CdSe, solid state-vapour phase equilb. 3=20977
- CoAl, ordering rel. to composition 3=16104
- Co-S, phase diagram 3=25734
- Cu-Zn-Sb alloys 3=23466
- DT, soln. in e-D₂, vapour-liquid equilibria, from triple pt. to crit. temp. 3=21626
- Fe-Al alloys, "K-state" and order diagram 3=23467
- Fe₂O₃-BaO 3=6812
- Fe-rich alloys, liq.-solid and δ - γ 3=13526
- Ga-As system 3=11199
- Ga I or II with Sn, Zn, In, phase diagrams 3=13527
- Ge-Al-Sb crystallization, heterogeneous, Al-Sb interaction 3=20902
- H-D systems, solid-liquid phase diagrams 3=21612
- HNO₃ → NO + NO₂ + H₂O, vapour-phase equilibrium 3=25813
- HT, soln. in e-H₂, vapour-liquid equilibria, from triple pt. to crit. temp. 3=21626
- He³, 0.02°-0.3°K, melting curve 3=14437
- Hg, liquid- α and α - β , under pressure 2=18227
- Hg-Sn, constitution diagram 3=13504
- Hg-Sn system 3=5116
- HgTe-MnTe system, zinc blende type 3=13543
- InAs-GaAs system, complete phase diagram 3=16120
- InSb-Sb eutectic alloys, phase-boundary energies 3=23401
- Mg₂Ge₂Si₂, 250°-600°K meas. 3=13142
- Mo-Zr-C system, rel. to composition 3=23476
- Nb-C system, equilibrium to 63.5 at.% C 3=18342
- Nb-Ru alloys 3=22662
- NiAl, ordering rel. to composition 3=16104
- Ni-Co alloys, rel. to ferromag. domain patterns 3=18079
- Ni-S, phase diagram 3=25734
- Ni-Se, phase diagram 3=25734
- O₃-CF₄, liquid system, diagram 3=21334
- Pb-In alloys 3=25731
- PbO-TiO₂-ZrO₂ system 3=3255
- PbSe-Bi₂Se₃ system, phase diagram 3=25742
- PbSe-Sb₂Se₃ system, phase diagram 3=25741
- PbTe, diagram, temp.-press. projection 3=13512
- PbTiO₃-BaZrO₃ system 3=13481
- Se₂O₃-Ga₂O₃ system, melting and solid solns. 3=12001
- Sn-Te phase diagram near SnTe 3=6861
- Th-In diagram rel. to temp. and press. 3=20886
- Ti-Al alloys, three phases 3=13502
- Ti-Al-Co alloys, ageing process 3=18354
- Ti-Cr alloys 3=22898
- γ -U-6 at.% Mo, kinetics of isothermal decomp. 3=25764
- UO₂, at 1600°C, U precipitation 3=13591
- U-Pu-C ternary phase diagram below 50 at.% C 3=25747

Phase equilibrium — contd

- U-Pu-C ternary system, below 635°C 3=25748
- V₂O₅, phase diagram 3=15779
- W-44 at.% Mo, ordering 3=20891

Phase transformations

- A_{0.5}B_{0.5} alloy, order and disorder-antiphase transitions 3=8887
- alloys, b.c.c., ordering with 4 kinds of site 3=8904
- alloys, eutectic, nucleation 3=13503
- alloys, growth of diffusion-limited centre 3=5127
- alloys, mag. directional ordering, rel. to super-lattice 3=18072
- alloys, order-disorder, by single-vacancy migration 3=13530
- alloys, ordering, by two-time Green functions 3=11292
- alloys, second phase precipitation rel. to boundary migration 3=13534-5
- anorthite, 25°-350°C 3=16019
- austenitic steels, martensitic components 3=23483
- austenite, fine structure due to martensitic transform. 3=20866
- austenite, supercooled, ferrite grain growth 3=5127
- binary alloys, short range order effects 3=8901
- biphenyls, effect on γ -radiolysis 3=3411
- β -brass, martensite formation, during electrolytic thinning of foil 3=8891
- cholesterol esters, liquid crystals 3=21370
- coherent lattice rearrangement 3=3284
- constitution diagrams, for b.c.c. lattices, AB and A₂B long-range order 3=3325
- critical assemblies, small-angle scatt. 3=52
- critical isotherm near critical point 3=3924
- cryogenic solids containing free radicals, effect on flame propagation 3=5161
- crystallization, NaCl, "Morphodrome" diagrams 3=16042
- cyclohexane, solid, rel. to positron annihilation 3=2774
- diamond, allotropic, graphite orientation 3=20776
- diamond, graphitization, surface orient. effect 3=13398
- diamond, under high-pressure 3=23375
- eutectics, binary, lamella-rod transition 3=25758
- f.c.c. \rightleftharpoons h.c.p., rel. to cold working 3=3256
- f.c.c. lattice, Ising, mag. ordering theory 3=8649
- f.c.c. metallic alloys, antiphases 3=20881
- ferro-antiferromagnetic, entropy changes 3=15750
- ferroelectric, broadening, mechanism 3=17935
- ferromagnetic materials, first order, rel. to magnetic disorder 3=1002
- ferromagnetic, short-range order at Curie point 3=11042
- ferromanganese alloy, $\gamma = \epsilon$, cycles 3=5128
- fluids, canonical partition function, cellular method 2=21292
- glass, in polymeric materials, multidim. 3=25766
- "globular" organic cpds., neutron inelastic scattering 3=13393
- graphite, melting, high pressure 3=6818
- graphite, rhombohedral form prod. by deformation 3=25627
- graphite to diamond 3=6819
- heat transfer bibliography 3=7364
- heterogeneous nucleation, review 3=11206
- hexamethylbenzene rel. to conductivity 3=10873
- high-pressure, visual obs. 3=11208
- ice, II, III and V, at atmospheric pressure 3=11202
- irons, cast, graphite formation during cooling from 1000-700°C, from u.s. velo. decrease 3=23473
- Ising model, dimer statistics 3=14043
- Ising model long-range interact. 3=12899
- kinetics study using dilatometer 3=21277
- liquid-glass 3=12003
- martensite-ferrite, thermodynamics 3=5120-3
- martensitic, dilatation parameters 3=8889
- martensite-ferrite, thermodynamics 3=5120-3
- martensite temperature, rel. to twinning temp. 3=11288
- Nichrome, at low temp., volume changes 3=20885
- Nimonik-type alloys, ageing 3=16113
- nucleation by crystalline particles 3=7394
- order-disorder in alloys, interact. bet. atoms 3=8380
- order-disorder, polar model 3=8899
- order, short-range, in alloys 3=8905
- ordering, rel. to mechanical properties 3=20685

Phase transformations — contd

- organic compounds, liquid-polycrystal region 3=21355
 organic cpds., rel. to Debye dipolar absorption 3=22987
 n-paraffins, crystalline, theory 3=16020
 pentaerythritol, effect of high pressures 3=3252
 phase boundary stability round growing particle 3=11297
 polyvinylcarbazol in benzol, vitreous 3=8920
 quartz, $\alpha = \beta$, and deform. 3=15990
 quartz, amorphous—cryst., by Ag diffusion 3=13396
 quartz, on heating in H_2 , amorphous state with crystallization centres 3=20917
 rare-earth arsenates and vanadates, pressure rel. to ionic radii 3=18225
 Rochelle salt, para-ferroelectric, mechanism, and Raman spectrum 3=20484
 and scattering, light, ferroelectric 3=20450
 second kind, ordering kinetics 3=6864
 second order, ferromag. to mixed ferroelec. and ferromag. phase 3=23147
 sintered material, elastic energy 3=20769
 solid solutions, order—disorder, f.c.c. lattice, appl. of nonlinear integral equations 3=18347
 solid solutions, super-saturated, decomposition kinetics, theory 3=20907
 in solids, review 3=11207
 steel austenitic, stainless, Ti stabilized, σ -phase formation 3=3337
 steel, Ni—Cr—Mo alloy, martensite formation rel. to tensile stress 3=3323
 superconductors, spin ordering 3=12023
 ternary semicond. cpds., ordering mechanism 3=18350
 water, freezing, sorbed on Si gel, n.m.r. obs., to $-100^\circ C$ 3=19069
 zincblende, under high-pressure 3=23375
 Ag—Al, ordering in hexagonal ϵ -phase 3=6862-3
 AgCd, order—disorder, by X-ray diffr. and mech. testing 3=3328
 AgNO₃, kinetics of phase growth 3=13401
 Ag—Sb—Te, AgSbTe₂ phase formation 3=18345
 Ag₂Te 3=18384
 AgZn, heats of formation of three phases 3=1352
 Al—Ag, ordering inside Guinier—Preston zones 3=8877
 Al—Cu solid solutions, matrix block struct. changes 3=20906
 AlNiCo 500, AlNi, magnet by microsonde and microhardness 3=16090
 Al₂O₃—AlN systems 3=10985
 Al—Re, diagram, new phase ReAl₃ 3=20882
 AlSb, to metallic form at high pr. 3=11211
 Al—Si, ageing, effect of Mg 3=18355
 Al—Si solid solutions, matrix block struct. changes 3=20906
 Al—Tc, diagram 3=20882
 As, up to 70 kbar 3=19067
 As₂Se₃—As₂Te₃, crystalline (low-temp), vitreous 3=18364
 As₂Se₃, crystalline—vitreous, short-range order 3=10802
 AuCu 3=10720
 Au—Mn, new hexagonal phase between Au₄Mn and Au₃Mn 3=3312
 BN, direct trans. of hexagonal to denser forms 3=11203
 Ba, b.c.c. \rightarrow BaII 3=16834
 Ba, electronic, 5d, 6s levels, high pressure, calc. 3=23372
 Ba(NiW)₁₀O₁₆ 3=8864
 BaTiO₃, cubic—tetragonal, elastic energy 3=20769
 BaTiO₃, cubic to tetragonal transition 3=6816
 BaTiO₃, cubic—tetragonal, nucleation 3=4942
 BaTiO₃, ferroelec. nucleation, field induced 3=4943
 BaTiO₃, tetragonal to cubic, effect of grain size 3=8792
 Be—Fe alloys 3=11290
 BeO, high temp. polymorph 3=1320
 BeO, 2100°C 3=2818
 Bi, effect of Sb and Pb impurities, under pressure 3=25751
 Bi, up to 70 kbar 3=19067
 BiFeO₃, 700°–800°C 3=20770
 Bi₂O₃—Nb₂O₅ systems meas. 3=6813
 Bi—Pt alloys between PtBi and PtBi₂ 3=11280
 C films, graphitization 3=13395
 C, new phase above 150 kbar 3=18229
 Ca₃GeO₈, temps., by thermal analysis 3=23373

Phase transformations — contd

- Cd—Mg alloys, order—disorder 3=16103
 Cd oxide pressed powders with excess Cd or O, between impurity and lattice scattering 3=22940
 CdSe, polymorphic, at 0–50 kbar 3=16016
 CdTe, polymorphic, at 0–50 kbar 3=16016
 Ce, 20–350°C, up to 80×10^3 kg/cm² 3=16014
 Co, thin sections, h.c.p. to f.c.c. obs. by electron diffraction and microscope 3=1351
 Co—Ni alloys, h.c.p. to f.c.c. electron diffract. and microscope observation 3=1351
 Cr spinel systems 3=16018
 Cr spinelides, rel. to calcination 3=16081
 Cr—Nb—Ni system 3=5119
 Cr—Ni system, equil. diagram 3=11289
 Cu, polygonization, rel. to impurities 3=20897
 Cu—Al alloy, ordering, rel. to quenching temp. 3=18349
 Cu—Al alloys near solubility boundary, ordering 3=5132
 Cu₃Au alloy, ordering process, elec. data 3=3330
 Cu₃Au alloy, ordering process, Hall effect data 3=3331
 CuAu, growth of ordered regions 3=8902
 Cu₃Au, kinetics of ordering 3=20889
 Cu₃Au, ordered, disordering by particle bombard. 3=4895
 Cu₃Au, ordering, influence on Hall effect 3=839
 Cu₃Au, ordering kinetics, X-ray obs. 3=13529
 Cu₃Au superlattice, off-stoichiometric 3=13495
 Cu₃Au, ordering, thermoelec. meas. 3=25753
 Cu—Be, aged, orientations of new phases 3=16099
 Cu—3%Co, rel. to precipitation hardening 3=20898
 CuFe₂O₄, cubic—tetragonal, from Mössbauer effect 3=11205
 CuFe₂S₃, polymorphic, rel. to mag. props. 3=11049
 Cu oxinate 3=18257
 Cu phthalocyanine 3=18257
 Cu salicylate, crystal, mag. different 3=23374
 Cu—Si alloy, $\alpha \rightarrow \kappa$ transf., role of vacancies 3=1353
 Cu—Si—(Mn) alloys, rel. to deformation and annealing 3=22701
 Cu—Ti alloy, rel. to plastic deformation 3=5126
 β -CuZn, order—disorder, neutron diffr. study 3=16105
 Cu—Zn—Cd, diagram, section 500°C, 100–35% Cu 3=8898
 Dy, ferro- and antiferromagnetic, exchange interaction mechanism 3=20573
 Dy, paramag.—antiferromag. transition, pres. effects 3=20552
 Fe, A₂ and A₄, heats meas. 3=10598
 Fe, α — γ , γ — δ , wires, plastic deformation, irreversible 3=23471-2
 Fe, $\alpha = \gamma$ interface 3=13494
 Fe, α — γ , rel. to energy loss in electron scattering 3=2040
 Fe, f.c.c. and b.c.c., lattice stability 3=13523
 Fe foils, martensite, by optical microscopy 3=8890
 Fe, martensite—ferrite, thermodynamics 3=5120-3
 Fe, torsion at 700°–1250°C 3=6857
 Fe—Al alloy, atomic order rel. to elastic modulus 3=25605
 Fe—Al alloys, short range order coeffs. 3=13505
 Fe—Al solid solns., ordering, theory 3=6871
 Fe₃Al, mag. and elec. props., equilib. diag. 3=3326
 Fe—Al, ordering kinetics 3=3327
 Fe₃Al superlattice, martensitic 3=16102
 Fe—Au alloys, A₁, temp. 3=11285
 Fe—3.8% Au solid solution, plates to particles 3=8882
 Fe—C alloys, austenite, isothermal, pressure effects 3=11286
 Fe—Co alloys, order—disorder 3=1355
 Fe—Co alloys, order—disorder 3=13506
 Fe—Co alloys, ordering, recrystalliz. 3=11296
 Fe—Co, order—disorder, neutron diffr. exam. 3=23478
 Fe—Cr—C, austenite—martensite 3=18346
 Fe—Cr—Ni alloy films, f.c.c. to h.c.p. and b.c.c. 3=23474
 Fe—Cr—Ni alloys, martensitic 3=20883
 Fe—Ir alloys, A₁, temp. 3=11285
 Fe—Mn—C foils, martensite nucleation 3=23475
 Fe—Ni alloy in fine particles 3=8897
 Fe—Ni alloys, γ — α — γ , rel. to H permeability 3=18344
 Fe—Ni alloys, Invar type, mag. transforms. and elasticity 3=25607
 Fe—Ni alloys, order—disorder 3=1355

Phase transformations — contd.

- Fe-Ni foils, martensite nucleation 3=23475
 Fe-Ni, order-disorder transition 3=8900
 Fe-Ni alloy, martensitic 3=20883
 Fe-Ni alloy, reverse martensitic, structure 3=20866
 Fe-Ni films, martensitic transform. 3=20884
 Fe-Ni-Al solid solution, decomposition, initial stage 3=20909
 Fe-Ni-Mn alloys, antiferromag. ordering 3=13284
 FeO, by X-ray exam. 3=11200
 Fe_2O_3 , $\gamma \rightarrow \alpha$ phases, theory 3=11204
 Fe_3O_4 - γ - Fe_2O_3 - α - Fe_2O_3 , mag. and dielectric props., 10^3 - 4×10^3 c/s 3=18071
 Fe-Os alloys, A₁, temp. 3=11285
 Fe-Rh alloys, Fe^{57} Mössbauer effects 3=17632
 Fe-Si alloys, A₁ point, volume change 3=10602
 Fe-Si alloys, $\alpha = \gamma$, effect of volume changes 3=5124
 Fe-Si alloys, ordering, Fe sites study 3=8335
 Fe-Si alloys, ζ -phase, eutectoid 3=6859
 Fe-3%Si, directional ordering by magnetic annealing 3=15804
 Fe-Tc alloys, A₁, temp. 3=11285
 FeTiO_3 - Fe_2O_3 , order-disorder, rel. to reverse thermo-remanent mag. 3=13255
 Ga II-III, polymorphic at high press. 3=6814
 GaSb, to metallic form at high pr. 3=11211
 Ge, antiferromagnetic, n-type, heavily doped 3=23135
 Ge, at high pr. metallic modifications 3=11210
 Ge, epitaxial films, amorphous-cryst. 3=3280
 GeO_2 , kinetics, 800°-1200°C 3=13400
 GeTe-SnTe alloys, rhombohedral-cubic 3=13524
 H, solid, second-order transitions 3=6450
 H₂S, solid 3=1325
 He^{3,4}, solid, hcp-bcc 3=16853
 He⁴, solid, with liq, He⁴II, rel. to thermal props. 3=1888
 Hf, at high pr. 3=13451
 HfO₂, monoclinic-tetragonal 3=25654
 Hg, liquid- α and α - β , under pressure 3=18227
 HgSe, high-pressure 3=3253
 HgTe, polymorphic, at 0-50 kbar 3=18016
 InAs, to metallic form at high pr. 3=11211
 InP, to metallic form at high pr. 3=11211
 InSb 3=20771
 InSb, metallic form 3=13517
 InSb, to metallic form at high pr. 3=11211
 InSe, amorphous, short-range order meas. 3=13515
 $(\text{K}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$, 270° and 410°C 3=20851
 KBr, high-pressure, from compressibility, shock 3=18179
 KCl, high-pressure, from compressibility, shock 3=18179
 K_2CrO_4 , up to 100 kb 3=25655
 $\text{K}_2\text{Cr}_2\text{O}_7$, up to 100 kb 3=25655
 KMnO_4 , up to 100 kb 3=25655
 KNO_3 , high-pressure polymorphs, rates 3=20772
 KPF₆, first-order transition, calorimetry 3=12927
 LaAlO_3 , to cubic phase, e.s.r. data 3=11112
 Li-Mg alloys, martensitic, rel. to elastic consts. 3=5125
 Mg-Cd alloys, order-disorder transformation 3=23479
 MnAs, first-order transition 3=15753
 MnAs, to ferromag., first-order 3=13226
 MnAu₂, ferro-antiferromagnetic, exchange interaction mechanism 3=20573
 MnHg, crystal distortion and magnetic transition, -75°C 3=6860
 MnO_3 , γ - β transform., X-ray study 3=23376
 MnRh ordered alloy, cubic-tetragonal charge 3=15752
 MnTe, fictitious, crystal structure, high temp. 3=23469
 $(\text{NH}_4)_2\text{BeF}_4$, ferroelec. phase transition 3=17941
 NH_4Cl , I = II, X-ray study 3=6810
 NH_4 fluoroberyllate, -100°C 3=17981
 NH_4HSO_4 , ferroelectric and specific heat, -2.55°C 3=20101
 NH_4PF_6 , 20°-300°K, calorimetric data 3=12927
 $(\text{NH}_4)_2\text{SO}_4$, -50°C 3=17981
 NaCl, structure change to CsCl-type at 18 000 kg/cm² 3=6811
 NaCl, crystallization, "Morphodrome" diagrams 3=16042
 NaCl, to cubic CsCl-type, under high press. 3=16015
 NaNO_2 , ferroelec. phase transition, X-ray study 3=25405
 NaNO_3 , ferroelectric, X-ray study 3=13397
 NaNO_2 , X-ray and neutron diffract. study 3=1336

Phase transformations — contd.

- $\text{Na}(\text{Nb}_{1-x}\text{Ta}_x)\text{O}_3$ 3=13394
 NaTaO_3 , 22°-680°C 3=23377
 NaYF_4 , crystal structure, 670°C 3=23455
 Nb oxides, and structure, from X-ray and electron diffr. 3=13458
 Nb and Nb-base alloys, oxides 3=11287
 Nb-N terminal solid soln., metal-gas equil. 3=11298
 Nb-Sn, 800-1000°C 3=8893
 Ni-Al bronze, β - α , non-equil. segregation 3=18352
 Ni-Be, aged, orientations of new phases 3=16099
 Ni-Fe alloy, by N atom insertion 3=1323
 Ni_3Fe , ordering, on annealing, and mag. anisotropy change 3=23155
 Ni-Mn alloy, ordering, effect of plastic deform. 3=5133
 Ni_3Mn , order-disorder, from Mössbauer effect 3=13528
 Ni_3Mn , ordering kinetics 3=3329
 Ni nitrides, by N insertion 3=1322
 Ni-P solid solutions, acid deposited, on heating, X-ray diffr. obs. 3=20876
 NiRh_2O_4 , crystal, 380°K, from mag. susceptibility 3=23196
 P, black 3=13399
 P_2O_5 , melt allotropy 3=21311
 PbTiO_3 - LaFeO_3 system 3=20852
 $\text{PbZr}_{0.85}\text{Ti}_{0.15}\text{O}_3$, and velocity acoustic waves 70-80°C 3=15618
 $\text{Pb}(\text{Zr}_{0.85}\text{Ti}_{0.15})\text{O}_3$, with 1 wt.% Nb_2O_5 , ferroelectric, FE_1 - FE_2 3=22998
 Pd-H, isotherms hysteresis 3=25750
 PtBi, 420° to 630°C 3=18332
 PtBi₂, 420° to 630°C 3=18332
 Pu, magnetic, ~ 55°K and Young's modulus temp. var. 3=20691
 RbF, f.c.c. to CsCl-type, 9-15 kbar 3=5077
 RbNO₃, thermal transformations 3=1252
 RbPF_6 , order-disorder, specific heat data 3=12927
 Re-Al, diagram, new phase ReAl_4 3=20882
 Re-Mo, atomic order in 2 σ -phases 3=25752
 Sb, up to 70 kbar 3=19067
 Si, at high pr. metallic modifications 3=11210
 Si, rel. to pressure 3=18228
 Sn, grey and white, interreln. 3=11209
 Sn-Pb alloys, 2-phase transition 3=13540
 Sn superconducting films, magnetic 3=19124
 Sn, superconducting, hysteresis 3=9687
 Sn, white-b.c.c. form, under pressure 3=13452
 Sr, $\alpha \rightarrow \beta$ and $\beta \rightarrow \nu$ 3=1216
 Sr-Bi titanates, -183° to 160°C, X-ray investig. 3=25653
 $\text{Sr}_2\text{FeNbO}_6$ 3=20773
 $\text{Sr}_2\text{FeTaO}_6$, at 250°C, X-ray study 3=18226
 $\text{Sr}(\text{NiW})\text{O}_6$ 3=8864
 SrTiO_3 , elastic and dielec. consts. 3=5055
 SrTiO_3 , n.m.r. study 3=8791
 SrTiO_3 , microscopic examination, liq. He temp. 3=17940
 SrTiO_3 - Bi_2O_3 - 3TiO_2 , rel. to dielec. props. 3=15620
 Tc-Al, diagram 3=20882
 Te, liquid to metallic, 10 800 kg/cm², 482°C 3=19066
 Th, carbide-iodide, allotropic 3=23378
 Th-Mo alloy 3=8896
 Ti alloys in quenching, β - ω martensitic 3=8892
 Ti, α -phase, containing O, ordering 3=6815
 Ti, α - β , rel. to energy loss in electron scattering 3=2040
 Ti, at high pr. 3=13451
 Ti, solid-solid, 0-90 kbar 3=20887
 Ti-(8%)Mn alloy, structural changes, rel. to wear 3=20890
 Ti-Mo alloy, martensitic phases 3=23477
 TiNi, low-temp. changes, rel. to mech. props. 3=13519
 TiO, ordering, rel. to vacancy behaviour 3=6815
 Ti, polymorphic, at high pressures 3=6814
 TiNO_3 , I = II, energy and temp. 3=11197
 TiNO_2 , thermal transformation 3=1253
 Ti_2Te_3 - Bi_2Te_3 3=18343
 U, α - β cycling, deformation 3=1354
 U, $\alpha = \beta$, mechanisms, review 3=5129
 U, α - β 3=25652
 U, up to 45 kbar pressures 3=8795
 U, oxidized in air 3=3250-1
 UC_2 (tetragonal) to U_3C_2 (cubic), mechanism 3=3324

Phase transformations — contd

- U—Cr alloys, β - α , cooling mechanism 3=3322
 U—Cr alloys, quenched from β -phase, by isothermal dilatometer 3=6858
 U-fission alloys containing Tc 3=5130
 U—Nb alloys, rel. to cooling 3=8894
 U—Nb, γ - β , rel. to cooling 3=8888
 U—Nb, retained β -phase \rightarrow α -phase in U 3=16100
 UO_3 — U_3O_8 , rel. to elec. props, 25°–200°C 3=25371
 U_3O_8 , X-ray diffrn. study 3=15445
 V, rel. to thermoelec. power anomaly 3=13140
 VO , metal-to-insulator, effect of press. 3=1254
 V_2O_5 , metal-to-insulator, effect of press. 3=1254
 Y Fe garnet, by differential thermal anal. 3=8796
 Y, Fe oxide mixtures, by differential thermal anal. 3=8796
 Yb, f.c.c. to b.c.c 3=6718
 Yb 3=13038
 Yb, 20–40 kbars pressure, rel. to elec. props. 3=17899
 ZnO , high-pressure polymorph 3=3254
 Zn—Sb alloys, X-ray diffr. analysis 3=8895
 ϵ - Zn_3Sb_2 , 405, 437°C, from discontinuities in thermoelectricity 3=20436
 ZnSnAs_2 , order—disorder, and conductivity thermal var. 3=20118
 ZnSnAs_2 , 635°C 3=11267
 Zr, at high pr. 3=13451
 Zr, solid—solid, 0–90 kbar 3=20887
 ZrO_2 , monoclinic—tetragonal 3=25654
 ZrO_2 —CaO, order-disorder transition 3=25728

Phonographs

See Sound reproduction.

Phosphorescence

See Luminescence.

Phosphors

See Luminescence; Luminescent devices.

Phosphorus

- As, Mn, Ga contamination, neutron activation detm. 3=1398
 atoms, μ -mesic, de-excitation 3=6373
 black, crystalline, electrical and optical props. 3=17891
 black, crystal structures at high pr. 3=13399
 diffused in Si, distribution 3=2833
 diffusion-doping in Si tunnel diodes 3=20361
 diffusion in GaAs, rel. to GaP—GaAs formation 3=20227
 diffusion in Si, fast mechanism 3=2832
 diffusion, in Si, ion bombarded 3=22823
 ions, forbidden transition probabs. calc. 3=25055
 μ -polarization, search, red P 3=15314
 P—polythene, neutron meas. 3=2284
 P^{31} in PCl_5 , effect on n.m.r. of rotation of specimen 3=25584
 resistivity rel. to pressure up to 3×10^5 kgm cm^{-2} 3=2902
 solid white, n.m.r. relaxation times 3=5050
 spin—spin coupling with protons 3=719
 supercooled, crystallization waves 3=9658

Phosphorus compounds

- molecular groups in crystals, i.r. vibration frequencies 3=20483
 phosphates, neutron irradi. annealing 3=22872
 phosphoryl and thiophosphoryl halides, potential consts. and thermodyn. props. 3=2634
 H_3PO_4 , Al, electrolysis, luminescence, flash spectra 3=10984
 H_3PO_4 , thermally dehydrated, Raman spectra and structure 3=15695
 PCl_3 , bond length differences, theory 3=10497
 PCl_3 , n.m.r. spin—lattice relax., rotat. sample 3=20683
 PCl_3 , thermal conductivity of dissociating system 3=9503
 PD, vibr. relax., by u.s. velocity dispersion 3=22567
 PF_4 , e.s.r. in NH_4PF_6 , rel. to γ -irrad. 3=20652
 PH_3 , phosphine, near u.v. absorption spectra 3=19996
 PH_3 , quantum-mech. theory, semiempirical 3=25112
 PH_3 , Urey-Bradley force field 3=22552
 PH_3 , vibr. relax., by u.s. velocity dispersion 3=22567
 $(\text{PNCl}_2)_3$, Cl^{35} nuclear quadrupole resonance 3=23264
 P—Ni films, elec. cond. 3=10725
 PO, potential and dissociation energies 3=17582

Phosphorus compounds — contd

- PO_2 groups, characteristic vib. freqs. 3=12838
 P_2O_5 , melting and crystallization 3=23420
 P_2O_5 , viscous flow and melt allotropy 3=21311

Photochemistry

See also Photographic process.

- acetone, flash photolysis. 3=25835
 anthracene—electrolyte interface, photoelectrolytic effects 3=23549
 apparatus for extreme u.v. 3=3404
 aqueous azide solns., photolysis 3=6922
 butene-2, Hg-photosensitized decomp. at low press. 3=8971
 chlorination of H_2 , CH_4 , CHCl_3 and C_2H_6 , isotope effect 3=11356
 crystals for different photographic emulsions, property variations 3=1396
 1,3-cyclohexadiene : 1,3,5-hexatriene system, internal conversion 3=11355
 diethyl ketone— CCl_4 mixtures, photolysis 3=18455
 2,4-dinitrotoluene, isomerization, acid catalysis of fading. 3=25836
 ether solutions of K metal and of naphthacene dianion flash photolysis 3=16180
 ethyl radicals, reaction with I atoms 3=8972
 ethylene, Hg-photosensitized reaction at high temp. 3=8970
 fluorescein, aq. soln., various ionic forms 3=3809
 gas-phase reactions, new approach to rate theory 3=11357
 in photo-ionization region 3=13618
 light source, vac. u.v., H lamp 3=14330
 methane, ethane and ethylene, at wavelengths below 900 Å 3=13618
 Methane, photolysis, by vacuum u.v. 3=25834
 monochloroethyl and trichloromethyl radicals, recombination and disproportionation 3=8974
 phenanthrene, from photolysis of cis-stilbene 3=23551
 triplet state energy transfer 3=13616
 viologens, free radicals, e.s.r. spectra 3=20028
 AgBr, print-out effect, defect electron behaviour 3=3406
 AgCl, Cu-doped, rate of volume photolysis 3=11358
 CdS, elec. and photoelec. meas. 3=3407
 CdS, luminescence temp. depend. 3=15705
 Hg photosensitization, electron energy transfer 3=25053
 $\text{Hg}(^3\text{P}_1)$, reactions with hydrocarbons, D isotope effect 3=8973
 HN $_3$, photolysis in solid CO_2 , i.r. spectra 3=3402
 HNC, photolysis from CH_3N_3 , i.r. identification 3=22584
 HNO $_2$, i.r. isomerization 3=16159
 HO $_2$, intermediate, i.r. spectroscopic evidence 3=17586
 KBr, U_2 -centre 3=10696
 KCl, U_2 -centre 3=10696
 NO $_2^{16}$, photolysis, 4047 Å, temp. var. 3=25833
 NO $_2$, photolysis 3=18456
 NaCl, U_2 -centre 3=10696
 Si—KOH boundary 3=6923

Photoconductivity

- alkali halides, due to u.v. 3=20248
 alkali halides, vac. u.v. 3=10964
 alkali metal azides, 1400–10 000 Å 3=25415
 anthracene, free carrier generation via exciton—exciton interactions 3=10887
 anthracene, meas. and exciton model 3=2970
 anthracene, mechanism 3=8568
 anthracene, sensitized 3=13129
 anthracene, with electrolyte contact, photoelectrolysis effects 3=23549
 anthracene, X-ray and u.v. 3=6628
 cationic dyes, dark conductivity 3=25416
 cells, vacuum emission, for precise photometric meas. 3=3862
 chlorophyll a 3=20401
 chlorophyll a, spectral distrib., rel. to layer thickness 3=20400
 crystal, latent image formation and decay 3=5544
 diamond, due to imperfections 3=2975
 diamond, type IIb semicond., optical phonon effects 3=10933
 dielectrics, by γ -irrad., mechanism 3=4950
 dye photoconductors, e.s.r. study 3=23021
 dyed gelatin 3=20413

Photoconductivity — contd

- and electrophotographic image, latent 3=17908
- F-centres, internal photoeffect in elec. field 3=15453
- F'-centres, photoionization theory 3=20243
- haemoglobin 3=20413
- longitudinal, strongly absorbing crystals, calc. 3=17952
- for meas. trapping levels, fast 3=17846
- molecular crystals, triplet-state processes 3=3060
- nonuniform excitation, analysis 3=20394
- optical freq. mixing in bulk photoconductor, quantum theory 3=20397
- org. molec. crystals in triplet state 3=4951-2
- phase displacement with exciting radiation 3=20393
- organic films, polymer $\sim 1\mu$ thick 3=25420
- phthalocyanine crystals, and spectra, absorpt. 3=20495-6
- phthalocyanine crystals, intensity depend. 3=23019
- phthalocyanine, metal-free crystals, bulk currents 3=8528
- phthalocyanine, metal-free single crystals 3=10890
- relaxation times meas. near 10^{-8} sec. 3=16885
- response of photocond. imaging devices with floating electrodes 3=24067
- semiconductors, impurity and intrinsic photocond. kinetics 3=2968
- semiconductors, impurity, rel. to capture levels 3=15628
- semiconductors, inhomogeneous, bulk effect, theory 3=2095
- semiconductors, organic, two-exciton ionization 3=20396
- semiconductors, use for local level study 3=2878
- simple photoconductor, response to square light pulse 3=10886
- space-charge polarization in photocond. insulators 3=15627
- sulphates, visible and u.v. meas. 3=8570
- sulphide phosphors, relax., reaction kinetics 3=4953
- thermoplastic photoconductive optical image recorder 3=19030
- theory, based on carrier mobility variations 3=6624
- triphenylmethane dye halides, dark conductivity 3=25416
- ultrasonic absorption, review 3=10594
- AgBr 3=2969
- AgBr 3=6636
- AgBr, rel. to latent-image formation 3=11948
- AgBr, transient, with and without mag. field 3=8529
- AgCl 3=2969
- AgCl, electron mobility in high elec. fields 3=8387
- AgI 3=2969
- Au films on p-type GaP photoelec. positive hole range 3=908
- BaN₂, u.v., spectral distrib. 3=25450
- Bi 3=8572
- Bi-Sb alloys 3=8572
- CaF₂, photoconductivity, in electric fields 3=20406
- CdS crystals, 300°-70°K 3=13202
- CdS, cubic and hexagonal 3=6631
- CdS, dark polarization 3=20404
- CdS, effect of hydrostatic pressure 3=15588
- CdS field-effect transistor, free hole density rel. to temperature 3=13137
- CdS, films 3=22941
- CdS, γ -ray conductivity 3=6629
- CdS in blocking electrodes, true photocond. 3=17955
- CdS, increase near In, Ga contacts 3=17956
- CdS, long-wavelength sensitivity, rel. to heat treatment 3=17954
- CdS, modulated excitation, photocond. spectrum 3=23012
- CdS, negative 3=903
- CdS, ohmic contacts, zone scanning 3=17953
- CdS and photoelectric emission, nonequilibrium 3=19308
- CdS, photoelectron trapping coefficient β , determination 3=13130
- CdS, polycryst. films, rel. to sintering 3=904
- CdS, polycryst., photocurrent carriers 3=905
- CdS, rel. to field emission spectrum 3=16972
- CdS, shadow region, elec. field effect 3=13131
- CdS, short pulse, and trapping levels, fast 3=17846
- CdS, spectral depend. 3=23395
- CdS, spectral distrib., annealing effects 3=11262
- CdS: Ag, nonuniform excitation 3=20394
- CdS-CdSe, transient effects 3=2972

Photoconductivity — contd

- CdS: Cu, Ga, photosensitive centre, e.s.r. study 3=23224
- CdSe, negative photodiodelectric effect, 20° and -180° C 3=10889
- CdSe, theor. explanation 3=10888
- CdTe, films, effect of additives 3=20407
- CdTe, n and p-types 3=15628
- (Cd,Zn)S layers, sintered 3=23016
- Co phthalocyanine crystals, and spectra, absorpt. 3=20495-6
- Cs films, rel. to thickness and temp. 3=15550
- CuFeS₂ 3=1027
- Cu₂O, long duration, due to O vacancies 3=18029
- Cu₂O, neg. effect in long-wave region 3=2971
- Cu₂O, negative near point contact 3=20402
- Cu₂O, rel. to temp. and wavelength, activ. energies 3=4954
- Cu₂O, relaxation time, temp. var., energy structure 3=20403
- Cu phthalocyanine crystals, and spectra, absorpt. 3=20495-6
- GaAs, p-n junction photocell 3=17914
- GaAs, p-n junctions, photoresponse near band edge 3=10848
- GaAs, p-n junctions, spectral photoresponse 3=13135
- GaAs, spectral response 3=13134
- GaP, p-type, rel. to energy level system 3=15632
- GaSe, impurity, relaxation, kinetics 3=20412
- Ge, and capture by deep impurity centres, negative, temp. var., n 3=23017
- Ge and excess-carrier lifetime, depend. on majority density 3=17848
- Ge, cross-section for photon and electron capture 3=15630
- Ge, electric field quenching, 1.8-2.5 μ , freq. depend. 3=17959
- Ge, extrinsic, with phonon emission 3=13133
- Ge films, effect of small amounts of O₂ 3=13062
- Ge films, effects of electronic interact. with CO 3=25346
- Ge, impurity conductivity in Cu-doped material 3=17859
- Ge, impurity photocond. 3=2976
- Ge, max. spectral response, minority carrier diffusion length 3=909
- Ge, modulation, carrier diffusion length meas. 3=20313
- Ge, negative, in mag. fields > 10 kOe 3=17958
- Ge, p-n junctions, spectral photoresponse 3=13135
- Ge, p-type, irradiated 3=15628
- Ge, recombination props. of Mn ions, meas. 3=17853
- Ge, rel. to deep radiation defects prod. by 1 MeV e's 3=20409
- Ge, 2nd and 3rd Cu levels, activation energies rel. to temp. 3=17849
- Ge single crystals, time depend. 3=17966
- Ge, spectral response 3=13134
- Ge, Au- and Sb-doped, kinetics 3=20411
- Ge, Cu-doped, carrier generation and recomb. 3=13132
- Ge, Cu-doped, impurity kinetics 3=20410
- GeS, photocond. spectrum 3=2990
- HgS 3=17962
- α -HgS, 600-100 m μ and X-rays 3=6600
- InSb, n-type, due to r.f. radiation 3=6634
- KBr, with anionic impurities 3=25464
- KCl, at cyclotron resonance of 35 Gc/s 3=20149
- KCl, F-band, rel. to γ -irrad. 3=23020
- Mg fluorogermanate, growth, rel. to u.v. irrad. 3=25837
- Mg fluorogermanate, rel. to u.v. irrad. 3=2978
- MoS₃, thin crystals at 77°K 3=10957
- NaCl crystals, X-ray 3=4955
- NaCl, polarization and elec.-field distrib. 3=10869
- Ni phthalocyanine crystals 3=20495-6
- PbI₂, extinction between 170°-190° C 3=17960
- PbI₂, rel. to photodecomposition 3=2921
- PbO, optical activation energy, rel. to temp. 3=17978
- PbO single crystals 3=6635
- PbO, n-PbS-p-PbO films, surface, in Resistron charge-storage tubes 3=25419
- PbS 3=2977
- PbS:Ti₂S₃ evap. films, spectral response 3=23018
- PbSe layers, sensitive to 4.8 μ 3=15633
- Sb₂S₃, kinetics at room temp. 3=6627
- Sb₂S₃, kinetics, -100° to +100° C 3=20398
- Sb₂S₃-Sb₂Te₃ system 3=15585

Photoconductivity — contd

- Se photocells, turnover phenomena 3=6607
 Se, vitreous, positive and neg. response 3=13081
 Se xerographic plate, photoinduced discharge 3=15613
 Si, In-doped, decay 3=17833
 Si, modulation, carrier diffusion length meas. 3=20313
 Si, n- and p-type, remnant impurity photocond. 3=23022
 Si, p-n junctions, photoresponse near band edge 3=10848
 Si, p-n junctions, spectral photoresponse 3=13135
 Si, p-type, nonlinear depend. 3=2979
 Si, quantum efficiency, impact ionization 3=20416
 Si, spectral response 3=13134
 Si, structural defects after electron irradi. 3=22764
 Si, surface, minority carrier trapping 3=20415
 SiC, n- and p-type, kinetics 3=8571
 SiC, n and p-type, relaxation 3=15634
 SiC, p and n-type, spectral response 3=13136
 SrN₆, u.v., spectral distrib. 3=25450
 SrO.2B₂O₃ and SrO.4B₂O₃, lead-activated, by u.v. excitation 3=2925
 Te, electron lifetime and surface recombination velocity 3=877
 TiO₂, rutile 3=17963
 TiAsSe₃, glassy effect of I and Ge impurities 3=15635
 TiCl₃, low temp. 3=10891
 Tl₂SeAs₂Te₃, vitreous, retained in dark 3=20418
 ZnO, kinetics, effect of binders 3=17964
 ZnO, photodielectric effect, 3rd type 3=23023
 ZnS phosphors 3=25487
 ZnS phosphors, u.v.-excited, i.r. effects 3=23110
 ZnS:Al³⁺, correl. with e.s.r. meas., model 3=18128
 ZnS:Cu, u.v. irradi. 3=15614
 ZnS: Cu, Cl, from capacitance changes, rel. to green and blue emissions 3=911
 ZnS:Cu, rel. to luminescence 3=25422

Photoelasticity

- See also Double refraction, mechanical.
 conference summary, Nottingham (1963) 3=18761
 light modulator, photoelastic 3=16747
 materials for joined structure models 3=5396
 materials research appl. 3=13320
 polymethyl methacrylate, birefringence rel. to stretching 3=17982
 surface coating technique for stress meas. 3=23814
 symposium, Berlin (1961) 3=16557
 use in strain gauges 3=14092
 BaF₂ 3=916

Photoelectric emission

- alkali metal azides, 1400-10 000 Å 3=25415
 atomic, in determination of h/e 3=1575
 atomic, K-shell, high-energy calc. 3=12773
 atoms, K-shell, forward and backward 3=2588
 from Bi layers, thin, by γ-rays, ang. distrib. 3=8204
 cathode, massive, X-ray photoeffect rel. to fluorescence yield 3=6663
 cathodes, dielectric, X-ray 3=19311
 from charged particles 3=9731
 films, Cs₃Sb, K₃Sb, (Na₂K)Sb, (Na₂K)CsSb, effect of n irradiation 3=14632
 K-shell, for γ-rays of 0.5 MeV 3=2587
 metals, films, and electrons and holes, hot, m.f.p. 3=20264
 quartz, after crushing and coloration 3=14634
 semiconductors, review 3=19312
 from semiconductor surfaces, law 3=7633
 Ag films, by X-rays, 0.28-9 keV, effective depth 3=21864
 Ag halides 3=12940
 from Ag layers, thin, by γ-rays, ang. distrib. 3=8204
 Ag, thin layers, emission velocity distrib. 3=9835
 Ag, X-rays, 0.7-30 keV 3=14638
 Al, thin layers, emission velocity distrib. 3=9835
 Al, X-rays, 0.7-30 keV 3=14638
 Au films, by X-rays, 0.28-9 keV, effective depth 3=21864
 Au films, rel. to film thickness 3=425
 Au films, yield and work function 3=426
 BaN₆, u.v., spectral distrib. 3=24550
 Be films, by X-rays, 0.28-9 keV, effective depth 3=21864
 BeO layers, external photoeffect 3=24337
 CaCO₃ (Iceland spar), after crushing and coloration 3=14634
 CaF₂ (fluorite), after crushing and coloration 3=14634

Photoelectric emission — contd

- CdS, nonequilibrium and photoconductivity 3=19308
 Cr, by X-rays, effect of X-ray polarization 3=14630
 Cs polycyclic aromatic cpds. 3=16975
 Cs-Sb film, ang. distrib. 3=19213
 Cs-Sb films, rel. to composition 3=8495
 Cs₃Sb, film, effect of n irradiation 3=14632
 Cu, in region around K-absorption edge 3=6351
 Cu, X-rays, 0.7-30 keV 3=14638
 Ge, electron beam caused threshold shift towards longer wavelengths 3=19314
 Ge films, by X-rays, 0.28-9 keV, effective depth 3=21864
 KCl films, by X-rays, 0.28-9 keV, effective depth 3=21864
 KCl, X-ray effect, Auger fields for Cl and K 3=14633
 K₃Sb, film, effect of n irradiation 3=14632
 K-Sb films, rel. to composition 3=8495
 Na₂CO₃ 3=19306
 (Na₂K)Sb, (Na₂K)CsSb, film, effect of n irradiation 3=14632
 Nd, ang. distrib. 3=5694
 PbS, vacuum u.v. 3=8596
 Pt, X-rays, 0.7-30 keV 3=14638
 Sb-Cs, dark? 3=9836
 Si, band structure, electron, determ. 3=6491
 Si, rel. to band bending 3=9834
 Si, rel. to energy band structure 3=4960
 Si, volume and surface effects, rel. to doping 3=9833
 SrN₆, u.v., spectral distrib. 3=25450
 from SrO-coated cathodes 3=12238
 Ti, by X-rays, effect of X-ray polarization 3=14630
 U, ang. distrib. 3=5694
 W cathode, 10-50 eV 3=14631
 X-ray effect, using pulse-amplitude distrib. analysis 3=19309
 X-rays, 0.7-30 keV 3=14638

Photoelectricity

- See also Photoconductivity; Photovoltaic effects.
 alkali metal films, selective 3=20466
 anthracene, photodepolarization, nonlinear 3=20399
 bronze, outgassing effects, 3000-250 Å 3=21865
 gases, currents in plane parallel capacity 3=7250
 in Geiger-Müller counters, and back diffusion 3=5899
 laser radiation detect., noise effects 3=1810
 metal-semicond. systems, photovoltaic response 3=25387
 metallic thin films, photoelec. sensitivity 3=6626
 metals, inner, and free electrons 3=22897
 metal, two-photon surface effect, perturb. theory 3=6625
 microscope, scanning 3=16753
 NBS VUV research programme 3=9591
 polarimeters, rotation measurement by 3=5534
 pyrometers, radiation and optical, limits 3=1859
 semiconductors, and local-centre parameter meas. 3=20295
 semiconductors, homogeneity anal. method 3=15567
 semiconductors, various internal effects 3=2967
 spectroscopy by photocell, proposal 3=5520
 steel, stainless, outgassing effects, 3000-250 Å 3=21865
 AgCl, Dember effect in u.v., temp. depend. 3=2948
 AgCl, photoelectret state formation 3=15823
 Al, vacuum u.v., 6 to 30 eV 3=13145
 Au, outgassing effects, 3000-250 Å 3=21865
 Au, yield data, vacuum u.v., 8 to 24 eV 3=13145
 Be, outgassing effects, 3000-250 Å 3=21865
 CdS, effect of neutron irradi. 3=4917
 CdS, in photochemical reactions 3=3407
 CdS, photovoltage model 3=25421
 CdS single crystals, u.v. excitn. 3=2974
 CdS, with high impurity concn., props. 3=906
 CdS, X-ray effects, 15°, -176°C 3=20405
 CdTe, films, e.m.f., "single crystal", on NaCl, KCl, KBr 3=17957
 Cs-Sb layers, var. with Cs content 3=8574
 Ge, after heat treatment or exposure to oxygen 3=4174
 Ge diode, mag. field effects on current 3=20408
 Ge p-n junctions, noise due to illumination 3=22958
 InSb p-n junctions 3=879
 K, inner, var. with wavelength 3=22897
 K halides, pure, electron affinities 3=3034
 K, internal, quantum transition absorpt. 3=17976

Photoelectricity — contd

- KCl, additively coloured, photoemission of electrons 3=24336
- Li, K-absorption cross-section 3=704
- NaCl, pure, electron affinities 3=3034
- Ni, outgassing effects, 3000-250 Å 3=21865
- Pt, yield data, vacuum u.v., 8 to 24 eV 3=13145
- Se, depolarization, nonlinear, and carrier parameters 3=20417
- Se films containing S, electrets, depolarization 3=23006
- Sn, vacuum u.v., 6 to 30 eV 3=13145
- ZnS, Demer effect, rel. to vacancy conc. 3=20161
- ZnS, photovoltage model 3=25421
- ZnS:Mn, rel. to red luminescence 3=15711

Photoelectromagnetic effects

- apparatus for meas. 3=7411
- crystals, e.m. waves, allowance for surface excitons 3=20465
- metal cathodes, X-ray, secondary emission effects 3=19310
- p-n junctions, photomag. effect 3=2980
- p-n junctions, theory 3=17965
- semiconductors, graded-gap, calc. and meas. 3=17951
- semiconductors, theory 3=6637
- semiconductors with non-equil. concns. 3=17841
- Bi 3=8572
- Bi-Sb alloys 3=8572
- CdS crystals, 300°-70°K 3=13202
- Cd_xHg_{1-x}Te solid solution, i.r. spectra, rel. to composition 3=17997
- Ge and excess-carrier lifetime, depend. on majority density 3=17848
- Ge elements, prep. by optical polishing 3=4956
- Ge single crystals, e.m.f., time and thickness depend. 3=17966
- InSb, in alternating field at room temp. 3=6638
- PbS 3=2977
- Si, p-type, nonlinear depend. 3=2979

Photographic light sources

- for high speed photography 3=11945

Photographic materials

- See also Nuclear track emulsions.
- absorption, light, Ag grains in deposits 3=21576
- blackening gradients, electronic detm. 3=16727
- definition, "microcontrast" concept 3=11955
- emulsions, elec. cond. rel. to photochem. sensitivity 3=3899
- emulsions, luminescence, temp. depend. 3=16813
- emulsions, resolving power rel. to grain 3=5541
- emulsion turbidity effect in spectrum line photometry 3=1842
- films for astronomy and spectroscopy, visible and i.r. sensitivity 3=9631
- films, u.v., far, low fogging, for spectrometry 3=24064
- grain coarseness, standard and meas. methods 3=5540
- latent images, internal and external, topography 3=24063
- latent image distrib. 3=1396
- Lippman plates, for stationary light waves 3=24068
- photoconductors, high-resist. electrophotographic image, latent 3=17908
- photoelectrets, electrophotographic process 3=15622
- radiation response, ionizing 3=14390
- Sceptre, electron-flux X-ray film, calibration 3=2068
- transfer function, rel. to optical system aperture 3=21575
- AgBr, print-out effect, defect electron behaviour 3=3406
- AgCl, Cu-doped, rate of volume photolysis 3=11358
- Ag halide dispersions, particle size change. 3=25839
- PbI₂, print-out between 170°-190°C 3=17960
- Se xerographic plate, photoinduced discharge 3=15613

sensitivity

- aerial film, sine wave response approx. 3=3898
- antifogging and sensitizing action of noble metal salts 3=11952
- blackening rel. to exposure, general eqns. 3=11956
- bromide emulsion, pure, exposed at low temp. 3=9630
- emulsion, lateral diffusion of spectral lines 3=1843
- emulsion with Br excess, Villard effect 3=3900
- emulsions, sensitization techniques 3=7361
- films, information efficiency 3=3922

Photographic materials — contd
sensitivity — contd

- Ilford Q₂ plates, as ion detectors 3=5725
- images, granularity, theoretical laws 3=24065
- quantum, to X-radiation 1.54-113 Å 3=3902
- reciprocity, unusual, layers with 3=5543
- spectral sensitization, dye properties 3=11950
- spectral sensitization, recent theory 3=11949
- sulphur sensitizing mechanism in emulsions 3=11946
- theory, present status 3=11951
- var. with emulsion and developer props., exposing radiation, temp., and wavelength 3=11944
- X-ray films, blackening curve 3=9632
- ZnO, electrophotographic props. 3=9629

Photographic process

- See also Photochemistry.
- dye images, light absorpt. by heterogeneous systems 3=5539
- electrophotographic image, latent, photoconductors, high-resist. 3=17908
- electrophotographic latent image, two formation mechanisms 3=5544
- electrophotography, symposium review (Nov. 1960) 3=16815
- emulsion microcrystals, foreign centre separation 3=3903
- equivalent quantum efficiency, macroscopic and microscopic approaches 3=21578
- glasses, Ag-containing, after u.v. and γ -irrad. 3=24066
- image, effect of vibration 3=16812
- latent-image formation, mobile Ag ions 3=11948
- Mitchell theory of photographic sensitivity 3=11947
- modulation transfer function, meas. 3=21577
- photoconducting imaging devices with floating electrodes, response 3=24067
- photopolymer, visible latent image 3=5538
- picture quality rel. to modulation transmission function 3=7360

development

- Acufine developer for astron. use 3=5542
- density growth in solarization and re-reversal regions, AgBr 3=14383
- mechanism 3=11953
- noise, photon, and informational assessment 3=14389
- prints, visual contrast, calc. 3=14382
- reflexion prints, quality 3=14381
- review 3=11954

Photography

- See also Cameras; Cinematography; Lenses, photographic; Radiography.
 - aerial photographic targets, evaluation 3=18968
 - of Cherenkov rings produced in a gas 3=10081
 - electrophotographic props. of ZnO 3=9629
 - Herschel i.r. reversal effect in elec. field 3=3901
 - micro, automatic, 35 mm film 3=14388
 - response data, vector analysis application 3=16723
 - thermoplastic photoconductive image recorder 3=19030
 - Se, electro, electron and hole role 3=20417
- applications**
- aerial photography, transfer characts. of motion and air conds. 3=11961
 - astrometry, sources of error 3=7011
 - black and white films, subjective method of colour prodn. 3=3693
 - bubble chamber, (liquid H₂), tracking 3=4300
 - bubble chamber photos, data extraction and processing 3=532
 - bubble chambers 3=533
 - colour, for Lichtenberg figures 3=5597
 - contrast transmission of large ampl. sinusoidal signal 3=9633
 - diffraction intensities, integrated, meas. 3=9615
 - earth surface motion, technique 3=9004
 - electron beam oscillographs, recording 3=9852
 - electron beam oscillographs, recording 3=16980
 - electron diffraction camera 3=23530
 - emulsions as computer storage media 3=11962
 - flow visualization, colour schlieren systems 3=271
 - gases, electron avalanches obs. 3=12077
 - interference fringes, records, rapid meas. 3=14362

Photography — contd**applications — contd**

- lens representation by reflected wave pattern 3=1799
- motion analysis methods, high-speed 3=21291
- multiple scattering, microphotometric investigation 3=24718
- neutrons, thermal, photographic detectors 3=12477
- photometry, simple method, fogging exposure meas. 3=18959
- photometry, slit width effect on background correctn. 3=1843
- photometry of spectrum lines, effect of emulsion turbidity 3=1842
- plasma, r.f., Schlieren photog. 3=4146
- satellite photography with Schmidt camera 3=9385
- spectrochemical analysis, intensity-blackening curve detm. 3=1405
- stray light meas., theory and expt. 3=9581
- vapourization obs., C, by laser, 30 MW 3=21627
- X-ray diffraction prints, prep. of positives 3=13435

colour

- astronomy, compensations 3=16314
- crystallites, on film, after several years 3=14386
- dye images, theory 3=5539
- electron optical mass-thickness meas. 3=25799
- use for Lichtenberg figure study 3=5597
- schlieren method for wind tunnels 3=271

high-speed

- analysis of short times, technique 3=14387
- exploding ribbon blast shutter 3=11957
- framing camera photographs, image-smearing errors 3=19031
- He cloud chamber, photoelec. triggering system 3=2172
- light sources 3=11945
- using maser, optical, ruby 3=11960
- ruby laser appl. for flying bullet 3=1841
- ruby laser emission study 3=14336
- shutter, fast-opening ($<45 \mu\text{sec}$), large-aperture 3=14384
- stroboscopic, use of tachometer 3=3905
- ultrahigh, image-dissecting camera 3=3904
- ultrahigh-speed, instrumental methods review 3=21579
- 50 000 pictures/sec framing camera 3=11959

infrared

No entries this year

Photomagnetic effects

See Photoelectromagnetic effects.

Photometers

See also Spectrophotometers.

- airglow, all sky, photoelectric 3=18547
- altazimuth, using photomultiplier 3=9100
- for electron emission, field, CdS 3=18960
- flame, pneumatic annular atomizers 3=21549
- microphotometer, intensity recording 3=11485
- for optical density meas. of integrating Weissenberg reflections 3=23999
- photocell, FEK-01, for high-intensity beams 3=23998
- photodiode, Ge point contact, for 1000 Mc/s 3=886
- photoelectric, for weak sources, standardization 3=1787
- photoelectric, multicolour, for satellites 3=16726
- ratio, using simple optical system 3=3863
- sky brightness, continuous recorder 3=1446
- u.v., extreme, using planar analyser and electron multiplier 3=14631
- u.v., middle and vac., spectral detectors 3=14306
- visual, for use in solar research 3=9140

Photometry

See also Brightness; Densitometry; Illumination; Spectrophotometry.

- apparatus with revolving light bulb 3=234
- automatic intensity distribution meas. 3=23997
- B8, B9 type stars, U, B, V, H β photometry 3=11561
- filters, bandwidth, effects on detected energy 3=18585
- fluorescence emission anisotropy meas. 3=11900
- fluorescent materials, incident-emitted radiation, relationship 3=18019
- invention, discussion of claims 3=11879
- kinetic theory, appl. 3=9499
- light source colour temperature measurement 3=9587
- magneto-optical double resonance, light intensity difference meas. 3=5533

Photometry — contd

- Ne, gas discharge tube, line-source, ang. distrib. 3=16757
- photoelectric, precise meas. procedures 3=3862
- photographic, simple method, fogging exposure meas. 3=18959
- photographic, slit width effect on background correctn. 3=1843
- photographic, wide-range 3=9575
- photomultipliers, hum cancellation, due to light source 3=24177
- photovoltaic cell amplifier, transistor 3=19134
- planet Mars 3=18600
- planet Mars 3=18601
- planet Jupiter, electronic camera, surface features 3=18612
- planet Saturn, electronic camera, surface features 3=18612
- planet, Venus 3=18622
- planets, major, colour, photoelectric obs. 3=16342
- planets, Mars, Venus, Moon, multi-colour program 3=16340
- radiometry, optical 3=11880
- reflectance standard 3=1786
- scintillators, large, light-yield meas. 3=24001
- stars, giants and supergiants, 3-colour 3=9225
- sunspots, sun, lines and colour temp. 3=18627
- telephotometric systems, review 3=23655
- two luminous fields, illumination equality control 3=21514
- very faint stars, observ. limitation 3=16317

light sources

- voltage stabilizer 3=9698
- voltage stabilizer 3=16888
- Xe lamp, standard, pulsed, high intensity source 3=24000

Photomultipliers

- amplitude fluctuations gain/potential distrib. between dynodes, 56 AVP 3=21866
- astronomical pulse-counting appl. 3=9146
- astronomical, temp. regulation and effects 3=5695
- choice of operating mode 3=16977
- circuit for output stage 3=24185
- Cu-Be dynode, for ion counting 3=12264
- dark-current reduction by cooling to -196°C in cryostat 3=19316
- electron, statistical properties 3=19317
- FEU-33, time parameters 3=1805
- FEU-52 and FEU-53 3=2020
- fluctuations in counting rate, l.f. 3=7634
- gain, resolution, depend. on counting rate 3=9838
- gain stabilization circuit 3=24174
- γ -ray and X-ray detector for 0.1-3 MeV 3=4373
- high-current operator of R.C.A. type 2059 3=9840
- intrinsic noise control 3=14639
- i.r., intermittent response 3=7635
- Lallemand, spectral sensitivity variation 3=19315
- as light modulation detectors, 56 AVP 3=21509
- light source, pulsed, short, for meas. resolution 3=9586
- light source (W lamp) hum cancellation 3=24177
- Louvre-type, light pulse characteristics 3=9837
- magneto-optical double resonance detector units 3=5533
- operating characteristics, 7 in. diameter 3=19319
- optimum working conditions det. 3=9839
- output current pulses, amplitude distrib. 3=19320
- output modulation circuit 3=3979
- particle detectors, for mag. analyzers 3=19508
- photodetectors, u.v., description 3=7337
- pulse height distrib., cathode wavelength sensitivity, temp. var., IP21 3=19318
- pulse obs. with sampling oscilloscope 3=24340
- refrigerator, liq. N 3=1863
- review of recent types, parameters and uses 3=16976
- single electron response pulses, amplitude distrib. 3=24339
- single-electron statistics 3=17102
- stability improvement of FEU-35 model 3=2019
- subnanosecond, with short accel.-decel. region 3=4180
- thermal noise reduction, use in liquid scintillation counter 3=2156
- time characteristics, multipliers with large cathodes 3=24338
- time response, limitations 3=9706
- transit time investigations 3=4181
- X-ray spectroscopy, use 3=5802

Photons

- See also Cosmic rays, photons; Gamma-rays; Nuclear reactions due to photons; X-rays.
- angular distribution function, in cascade 3=4488
 coalescence, in nuclear Coulomb field 3=24672
 coherence, quantum theory 3=16725
 correlation expts., coincidence counting technique
 appls. 3=21511
 correlation experiments, linear and quadratic 3=21512
 correlation theory 3=11876
 description by Regge trajectory in electron scatt. 3=5987
 detector, scintillation, total absorpt., GeV region 3=10097
 detector, vacuum u.v. photoionization type 3=21537
 diffusion processes 3=22097
 elementary nature, from γ -e scattering 3=24673
 emission, elec. field induced from Ge 3=855
 in glow discharges, rel. to electron emission 3=7632
 high-energy physics, review lecture 3=14932
 inner composition, and quantum number 3=14933
 macroscopic causality in expanding universe 3=21085
 massive, rel. to gauge invariance 3=14855
 neutrino theory (Jordan) 3=16724
 noise, in photographs, and informational
 assessment 3=14389
 photon-electron showers, direct production from
 μ -meson interactions 3=14998
 photon fluid model, relativistic cosmology 3=1505
 production, He ion beam on W, 25-100 eV 3=21900
 production, ion beam on W, He, Ne ions, 25-100 eV 3=21900
 production in multiple particle prod., e.m.
 process 3=19593
 production in multiple particle prod., e.m. process 3=19594
 production, Ne ion beam on W, 25-100 eV 3=21900
 quantum electrodynamics, scattering 3=12390
 as Regge poles 3=22050
 Reggized, scattering theory 3=19574
 relativistic quantum theory 3=4327
 rest mass, rel. to electrodyn.
 quantization 3=536
 ruby, excited luminescence 3=4991
 self-energy, in lowest order, study from quantum
 electrodynamics 3=24586
 spin inertia effect, waveguide detection, and gauge
 invariance 3=19599
 splitting into two, in nuclear Coulomb field 3=2231
 Townsend discharge, absorption 3=4029
 velocity meas., moving sources, secondary re-
 emission 3=18958
- interactions**
- "beat" generation near charged particles 3=7302
 in cosmic ray extensive air showers 3=19719
 deuteron photodisintegration near threshold 3=19710
 electron pair prod. on nuclei, calc. 3=17257
 electrons, scattered by intense polarized beam, from
 laser, obs. possibility 3=12448
 e.m. cascades and polarization of medium 3=12432
 exchange contrib. to e-p scatt., $p + \bar{p} \rightarrow e^+ + e^-$,
 calc. 3=17247
 $\gamma + d$, pion photoprod., dispersion relations study 3=7890
 $\gamma + \gamma \rightarrow \gamma + \nu + \bar{\nu}$, in stellar neutrino emission 3=24689
 γ -H, 167 to 212 MeV, rel. to π^+ prodn. 3=4428
 $\gamma + N \rightarrow Y + K$, resonance model 3=24797
 γ -N, pion prod., π - π interact. effects 3=15016
 $\gamma + n \rightarrow p + \pi^-$, proton polarization 3=10115
 $\gamma + p$, high energy, μ , e prod. and comparison 3=22157
 $\gamma + p \rightarrow n + \pi^+$, energies up to $(\frac{3}{2}, \frac{3}{2})$ resonance
 threshold 3=2294
 $\gamma + p \rightarrow p + \eta^0$ reaction, search for 3=7914
 $\gamma + p \rightarrow p +$ low-mass anomaly 3=10151
 $\gamma + p$, pion photoprod., dispersion relations study 3=7890
 $\gamma + p \rightarrow p + \pi^- + \pi^+$, 300-800 MeV, rel. to
 interaction current 3=6035
 $\gamma + p \rightarrow p + 2\pi^0$, effect of $(\gamma, 3\pi)$ vertex 3=7895
 $\gamma + p \rightarrow n + \nu + e^+$ in stars 3=23693
 $\gamma + p \rightarrow p + \pi^+ + \pi^-$, rel. to γ - 3π vertex 3=7894
 $\gamma + p \rightarrow \pi^+ + n$, 165-212 MeV 3=6033
 $\gamma + p \rightarrow \pi^+ + n$, 200-450 MeV 3=22164-5
 $\gamma + p \rightarrow \pi^+ + n$, 200-260 MeV, fixed momentum
 transfer 3=22166

Photons—contd

interactions—contd

- $\gamma + p \rightarrow \pi^+, 0 + n, p$, surface of cross-section against
 photon energy and π angle, contours 3=22187
 $\gamma + p \rightarrow \eta + p$, 978 MeV, $\eta \rightarrow 2\gamma$ branching ratio 3=22187
 $\gamma + p \rightarrow \Lambda^0 + K^+$, K^+ "particle" exchange approx. 3=15041
 γ - 3π interaction and ω, ρ meson decay rates 3=6077
 $\gamma\pi$ coupling const., from double photoprod. expt.,
 theory 3=10072
 gravitons, first approx., by general relativity 3=5349
 with heavy vector mesons 3=24771
 hyperons, π -photoprod., dispersion rels. calc. 3=22196
 isobaric model, gauge invariance in Hamiltonian
 form 3=10073
 mesons, scalar, prod., unitary symmetry model 3=22155
 μ pair prod. in carbon, by 1000MeV bremsstrahlung of
 electrons 3=7879
 mutual interactions in vacuum 3=9573
 neutrons, pion prod., integral eqns. 3=4422
 non-linear, from masers, optical, review 3=17093
 nucleon-photon vertex parts, integral represent-
 ation 3=14889
 photon-gas processes, cross-section meas. 3=9509
 photoproduction of high-energy particles and Regge-pole
 hypothesis 3=22088
 π photoprod. on hydrogen, 550-900 MeV 3=19669
 production of intermediate vector bosons, calc. 3=10074
 production of π^0 in hydrogen at 200-300 MeV 3=10147
 strange particle photoproduction 3=22203
 transformation into neutrino pairs 3=2232
 transition strength functions, new resonances 3=15173
 $D, \pi^-/\pi^+$ threshold ratio 3=2294
 $d + \gamma$ (12-30 MeV), and mesonic effects? 3=12513
 d, π^0 prod., low angles, 190-220 MeV 3=24766
 He, disintegration meas. 3=6095
 $He^3 + \gamma \rightarrow p + d$, 8.5-22 MeV, 90° differential cross-
 sections 3=19716
 $He^3(\gamma, p)d^2, He^3(\gamma, n)2p$, up to 170 MeV 3=19715
 He^4, π^+ photoprod. 3=4425
 $He^4(\gamma, np)D^2$ 3=6093
 $He^4(\gamma, p)H^3$, angular distribution for 23-32 MeV γ 3=6092
 N, K-photoprod., dispersion rels. calc. 3=22196
 p, π^0 prod., low angles, 190-220 MeV 3=24766
 $p + \gamma \rightarrow K^{*+} + \Sigma^0$, low-energy 3=17334
- polarization**
- calculation, by equiv. photon method 3=2237
 measurement, electron pair prod. asymmetry in crystals,
 multi GeV 3=17234
 μ^- -mesons nuclear radiative capture 3=17488
 6 GeV beams, in crystal (001) plane 3=572
 Eu^{153m} decay, circular 3=15085
 Y^{90}, β decay, first forbidden, internal bremsstrahlung,
 circular, calc. 3=22332
- scattering**
- by electrons, relativistic, high energy photon
 prodn. 3=14934
 by electrons, scatt. amplitude, nonlinear effects 3=10075
 γ -e, non-linearity intensity 3=19600
 γ -p, elastic, η -meson and scalar boson contrib. 3=17233
 γ -quanta on oriented nonspherical nuclei 3=4620
 gas molecules, classification and review 3=7245
 graviton creation in mag. field and Coulomb scatt. 3=5349
 in imperfect crystals, diffusion effects, energy
 broadening 3=4859
 mutual interactions in vacuum 3=9573
 nuclear Coulomb field, at high frequ., theory 3=22363
 by spin- $\frac{1}{2}$ particle, elastic, ang. and energy depend. 3=571
 Thomson, high intensity non-linearity 3=19600
 As, near particle threshold energy, elastic 3=12853
 B^{11} , resonant scatt. by 2.14 MeV state 3=15171
 Bi, near particle threshold energy, elastic 3=12853
 C^{12} , excitation of 15.1 MeV level 3=24919
 Cd, near particle threshold energy, elastic 3=12653
 Co 60 photons, Compton scatt., ang. distrib. 3=22099
 Fe, near particle threshold energy, elastic 3=12653
 H, atomic, coherent, calc. 3=4715
 Hg 199 , 412 keV, nuclear reson. fluoresc. 3=19796
 on Ho 165 , 11-19 MeV bremsstrahlung 3=10322
 Mg, near particle threshold energy, elastic 3=12653
 Sb, near particle threshold energy, elastic 3=12653

Photons — contd**scattering — contd**

- Sn^{116} , resonance, 1290 keV 3=2429
 Zn, near particle threshold energy, elastic 3=12653

Photophoresis

No entries this year

Photovoltaic effects

- cells, amplifier, transistor 3=19134
 crystal-violet 3=25418
 p-n junction, nonuniformly illuminated, photovoltage 3=23024
 phototriode, theory 3=20419
 platinocyanides, and non-monomolecular processes 3=18030
 solar energy, converters, efficiency 3=15637
 II-VI cpds., photovoltaic heterojunctions 3=20420
 AgBr 3=2969
 AgCl 3=2969
 AgI 3=2969
 Au and Cu photoemission into CdS 3=23013
 CdS, obs. at sandwich cells 3=8569
 CdS, photovoltage model 3=25421
 CdS, with high impurity concn., props. 3=906
 CdS with metal-film coatings, potentials 3=907
 CdSe films, contact potential, wavelength depend. 3=23014
 $\text{CdS}_x\text{Se}_{1-x}$, vert. illum., spectrum, var. with x 3=23015
 CdTe evap. films, high voltage 3=2973
 Cu_2O , variation with temp. 3=6630
 GaAs, photo-Hall effect in high-resistivity crystals, temp. depend. 3=6632-3
 GaAs, p-n junction, nonlinear 3=20421
 GaAs, p-n junction photocell 3=17914
 Ge-(KBr-methylformamide solution) interface 3=10781
 InSb p-n junctions 3=879
 PbS, film, current-induced photo-e.m.f. 3=17961
 PbS layers 3=25417
 PbS layers, e.m.f. and structure 3=3356
 PbS, surface potential, changes on illumination 3=20414
 S, electrets, polarization in darkness, initial elec. field effects 3=25411
 $\text{Sb}_2\text{S}_3\text{-Bi}_2\text{S}_3$, 20-30 V/cm e.m.f.'s 3=15629
 $\text{Sb}_2\text{S}_3\text{-Sb}_2\text{Se}_3$, 20-30 V/cm e.m.f.'s 3=15629
 Sb_2S_3 , 20-30 V/cm e.m.f.'s 3=15629
 Sb_2Se_3 , 50-80 V/cm e.m.f.'s 3=15629
 $2\text{Sb}_2\text{S}_3\text{-Bi}_2\text{S}_3$, 20-30 V/cm e.m.f.'s 3=15629
 Si cells, changes prod. by particle irradi. 3=912
 SiC, semicond., p-i-n junction and V-I characts., p-n luminescence 3=13082
 Si p-n junction, thermally oxidized, γ -irrad. effects 3=4930
 SiC, p-n photoeffect 3=13136
 SiO_2 p-i-p junctions 3=10849
 Ta_2O_5 , p-i-p junctions 3=10849
 ZnS, photovoltage model 3=25421
 ZnSe 3=11011
 Zr electrodes coated with Ag, Au or Sn 3=15636

Physical chemistry

- $\text{CO}_2\text{-H}_2\text{O}$ system, in turbulent motion, mass transfer conc. effect 3=16152
 ionic association, statistical theory 3=13606
 n.m.r., principles and use, review. 3=25139
 Poisson transform. of

$$\sum_{j=1}^N F(\cos 2\pi j/N) \cos 2\pi jn/N$$
 3=21196

Physical effects of radiations

- See also under individual radiations, e.g. Neutrons, effects.
 alkali halides and azides, crystallite growth on cleavage planes 3=20254
 alkali halides, crystal decomposition rel. to electron irradi. 3=17808
 alkali halides, point defect formation 3=22730
 alkaline ice, O^- radiolysis, rel. to e.s.r. new singlet 3=23233
 aspects in nuclear energy, encyclopaedia 3=4285
 binary materials, knock-on cascades and point defects 3=8419
 ceramics, reflectivity 3=8585

Physical effects of radiations—contd

- channelling effects, long-range, in irradi. crystals 3=22874
 crystal damage, dynamics 3=22852
 crystal defects; approx. to rigid spheres 3=8417
 crystal lattice damage by fission fragments 3=22857
 crystal lattices, fission fragment damage 3=20253
 crystals, directional depend. of defect number 3=20250
 crystals, effect on melting and solution, dislocations 3=20188
 crystals, f.c.c., focusing collisions 3=2844
 crystals, fission fragment damage 3=22855
 damage experiments, analysis, Monte Carlo calculations 3=10403
 damage study, single-crystal X-ray diffraction technique 3=10699
 defects in solids, calc. method 3=4894
 diamond, colour changes from charged particles 3=20252
 dielectric properties, reversible changes 3=15609
 dielectrics, polarization 3=17923
 diodes, thermionic, inert gas, neg. resist. effects 3=2025
 displacement cascade theory, channelling effect 3=13019
 on electret-forming materials 3=17947
 energy dissipation sharing between electronic and atomic motion 3=8463
 f.c.c. lattices, assisted focusing collisions 3=8465
 films, solid, adsorption and desorption 3=6896
 γ -sources, effective use 3=2396
 glass, charged-particle damage tracks 3=22850
 glass, conference, Rochester (1962) 3=6549
 glass, reflectivity 3=8585
 glass, surfaces, ionic bombardment 3=17810
 graphite, Ar and air ion irradi. 3=17806
 graphite, ion-bombardment 3=22851
 graphite, neutron-irrad., interstitial annealing and displaced-atom formation 3=788
 graphite, thermal expansion, accommodation 3=8371
 graphite, vacancies and interstitials, bond energy 3=8425
 graphite, vacancy loops 3=20194
 graphite, vacancy loops, rel. to Ni-irrad. 3=17705
 halophosphate phosphors, effects of u.v. irradi. 3=10991
 handbook 3=2146
 insulators, internal polarization 3=20371
 integral eqns. governing energy transfer 3=25305
 ionic crystals, Rn^{222} and Xe^{133} labels, thermal release 3=823
 ionizing radiation, internal friction of quartz 3=23302
 metal films, fission fragment damage 3=17802
 metal films, temperature rise rel. to electron irradi. 3=17807
 metals, damage, nature 3=8466
 metals, diffusion, by heavy energetic particles 3=8457
 metals, f.c.c., point defects, review 3=8420
 metals of high purity 3=15531
 metals, h.c.p., focusing collision chains 3=22883
 metals, point defect production and annealing 3=22723
 metals, review 3=4895
 metals, review 3=4897
 metals, sputtering by U^{235} fission fragments 3=8152
 mica, Ar and air ion irradi. 3=17806
 mica, charged particle tracks, electron micr. study 3=2842
 mild steel, defect clusters, rel. to fission fragments 3=17803
 molybdenite, ion-bombardment 3=22851
 negative ions, radiative formation and destruction 3=4003
 noble metals, interstitial configurations rel. to deuteron-irrad. 3=22755
 noble metals, recovery 3=23345
 particle decay in condensed matter at high energies 3=22095
 on photographic materials, ionizing 3=14390
 Pile Grade graphite at 450°C 3=10433
 point defect cluster migration 3=22728
 polyethylene, elec. cond. 3=10866
 polyethylene, internal motion, n.m.r. study 3=13546
 polymers, mol. wt. distrib. 3=8325
 polypropylene, thermal props. rel. to γ -irrad. 3=2728
 primary knock-on atom, resting point distrib. 3=4893
 quartz, by X-ray scatt. and diff. 3=8473

Physical effects of radiations—contd

- racemates and antipodes, optical activity rel. to electrons from different sources 3=2996
- racemates and optical antipodes, optical props., electron effects 3=10920
- reactor materials and radiation damage conference 3=12716
- reactor-radiations, strength of materials 3=18209
- recoil atoms in ionic solids 3=8475
- rubber, natural, 1000 Å-thick films, spherulite morphology 3=20919
- semiconductor, microwave Faraday effect 3=2875
- semiconductors, defect annihilation, kinetics 3=22710
- solids, atom distribution due to primary excited atom 3=17799
- solids, by corpuscular irradi., review 3=2
- solids, charged particle tracks, etching 3=2843
- solids, charged particle tracks, investigation 3=17801
- solids, conference, Venice (1962) 3=6547-8
- solids, conference, Venice (1962) 3=10697
- solids, energetic atom range 3=8462
- solids, focusing collision chains, assisted 3=22884
- solids, focusing collision chains, theory 3=22882
- solids, nuclear radiation effects rel. to slow charged particle fluxes 3=8464
- solids, radiation damage, theory 3=17800
- solids, rel. to their properties and radiation's properties; review 3=2841
- specimen damage in electron microscope 3=20971
- stainless steel, defect clusters, rel. to fission fragments 3=17803
- steel, SA-212B pressure-vessel, mag. props. 3=11037
- water, radiation nucleation of bubbles 3=23864
- wurtzite structure, range of tunnel trajectories 3=22848
- Zircaloy-2, tensile strength 3=11170
- Ag, defect clusters, rel. to fission fragments 3=17803
- Ag halides, electron-hole production 3=12940
- Al alloys, damage, low-temp. 3=22860
- Al, damage, low-temp. 3=22860
- Al, dislocation loop growth on irradi., with fission fragments 3=6520
- Al, length change, yield stress, decrement and modulus, resistivity, 4°K 3=10698
- Al, loop movement, rel. to fission fragments 3=17803
- Al monocrystal, atomic ejection sequences by Ar⁺ ion bombardment, 50 keV 3=2845
- Al, vacancy and interstitial loops rel. to fission fragment bombardment 3=17706
- Au films, interstitial damage, rel. to Ar ion bombardment 3=17712
- Au foils, transition radiation and optical bremsstrahlung, rel. to electrons 3=20536
- Au, point defects, rel. to electron-irradi. 3=22726
- BaCrO₄, imperfections 3=13016
- Be, gas bubbles at grain boundaries 3=8471
- BeO, defect configurations rel. to heavy-atom bombardment 3=22865
- BeO, elastic consts. 3=5057
- BeO, internal stresses, by X-ray diffraction 3=6550
- BeO, stored energy, by calorimetry 3=9648
- Bi, in contact with Sn, melting 3=15525
- Cd, in contact with Bi, melting 3=15525
- Cd, in contact with Sn, melting 3=15525
- CdS, surface effects of light 3=8924
- Cr₂O₃, elec. conductivity 2909
- Cs oxide cathodes, i.r. irradi., fatigue effects 3=2018
- Cu alloys, damage, low-temp. 3=22860
- Cu-base alloys, rel. to diffusion-controlled reactions 3=11291
- Cu, bent, dislocations, etch pit study 3=2808
- Cu, damage, low-temp. 3=22860
- Cu, defect clusters, rel. to fission fragments 3=17803
- Cu, electron irradi. damage, rel. to energy 3=8468
- Cu, internal friction, electron irradi. 3=8758
- Cu, length change, yield stress, decrement and modulus, resistivity, 4°K 3=10698
- Cu, point defects, rel. to electron-irradi. 3=22726
- Cu, recovery 3=22751
- Fe-(3%) Si, magnetic relaxation rel. to n-irradi. 3=1042
- Fe-Si (4%), domain wall velo. 3=11068

Physical effects of radiations—contd

- GaAs, length changes 3=22861
- Ge, conductivity and Hall coeff. rel. to defects 3=22859
- Ge, conductivity, rel. to K-ion bombardment 3=17851
- Ge, defect prodn. and alteration, rel. to electron irradi. 3=22724
- Ge, patterns due to heavy-ion irradi. 3=22877
- H₂, ionization, recombination and mobility 3=16911
- In, in contact with Sn, melting 3=15525
- InSb, length changes 3=22861
- KCl, additively coloured, M-centre formation 3=4892
- KCl, crystal decomposition rel. to electron irradi. 3=17808
- KCl, hardening by irradiation 3=16008
- KCl, imperfections, rel. to electron and X-irradi. 3=22708
- KI, crystal decomposition rel. to electron irradi. 3=17808
- LiF, colour centres, line and band spectra 3=6540
- LiF, fission-fragment damage, surface structures 3=22863
- LiF surface damage by fission fragments 3=17804
- Mg fluorogermanate, photoconductivity growth, rel. to u.v. irradi. 3=25837
- Mg fluorogermanate, u.v. irradi. rel. to photoconductivity 3=2978
- MgO, point defects and absorption bands 3=22717
- MgO, slip bands, and microhardness rel. to electron irradi. 3=17761
- Mo, damage recovery 3=8470
- Mo, defect clusters and loops, rel. to fission fragments 3=17803
- Mo fission fragment damage, tracks 3=15526
- NaCl, reactor irradi., internal energy increase 3=13017
- Ni, domain wall velo. 3=11068
- Ni²⁺, in AgBr, AgCl, paramag. reson. and relax.; liquid H temps. 3=13307
- Ni-Cu (30%), domain wall velo. 3=11068
- Pb, in contact with Bi, melting 3=15525
- Pb, superconducting ring, trapped flux decay rel. to irradi. 3=3955
- PbI₂, fission-fragment tracks 3=25306
- Pt foils, dislocation loops, fission and α -part irradi. 3=8437
- Pt foils, fission damage 3=25275
- Pt, foils, loops and dots, rel. to U fission fragment, neutron and α -bombardment 3=17701
- Pt, prismatic loops 3=22767
- Pu, self-damage accumulation 3=22856
- Sb, microhardness decrease, rel. to i.r., irradi. 3=18218
- Si, conductivity and Hall coeff. rel. to defects 3=22859
- Si, defect i.r. absorption spectrum 3=23076
- Si, defects 3=22725
- Si, Li, doped defects 3=22704
- Si, n and p-type, defect introduction rates 3=6551
- Si photovoltaic cells, changes prod. by particle irradi. 3=912
- on UAl₄, fission fragment damage, electron microscope examination 3=13015
- U, irradi. creep, mechanism 3=2795
- U, irradi. -growth after mechanical working 3=8480
- U²³⁵, pore size and distribution, caused by fission gases, 200°C 3=22457
- UO₂, electron microscope study 3=22847
- UO₂, evolution of microstructure during fuel rod irradiation 3=25650
- UO₂, microstructural changes, rel. to burn-up 3=20960
- UO₂, under reactor conditions 3=20959
- W surface adsorption rel. to electron bombardment 3=18395
- Zn, patterns due to heavy-ion irradi. 3=22877
- Zn treated with Hg, dislocations rel. to electron and γ -irradi. 3=20178
- ZnCdS:Mn, luminesc., prior sensitization 3=10994
- ZnO: Li, u.v.-induced centre, e.s.r. 3=13310
- ZnS, u.v. irradi. in different gases 3=10969

Physics

See also Nuclear physics.
 anniversaries in 1963 3=5311
 1963 Institute of Physics and Phys. Soc. Craftmanship Competition 3=9314

Physics — contd

- 1963 Institute of Physics and Phys. Soc.
Exhibition 3=9313
propulsion method of toy boat 3=9638
research in non-Ph.D. granting institutions (USA) 3=5
response of distributed thermally activated
system 3=9327
Soviet, review 3=21185
in Ukrainian educational institutions 3=18686
unity, lecture by N.Bohr 3=21186

Physics fundamentals

- See also Cosmology; Field theory, classical; Field
theory, quantum; Fundamental particles; Indeterminacy;
Mechanics; Parity; Probability; Quantum theory;
Relativity; Thermodynamics; Units.
causality and multiply-connected space time 3=20
causality, rel. to elem. particle theory 3=5330
conceptual structure 3=16476
conformal tensor calculus, review 3=5317
CPT theorem, rel. to K^0 -meson props. 3=10010
Dirac monopole, rel. to parity in e.m. interact. 3=22054
equivalence, strong, proposed test 3=5350
fundamental particle constants and physics laws,
relation 3=14926
generalizations beyond quantum mech. 3=1609
invariance under transformations rel. to conservation
laws 3=3709
magnetic monopoles and parity violation 3=21205
matter-antimatter processes in cosmology 3=3532
physical equations from conceptual point of view 3=13985
potential theory, integral equation methods 3=23733
predictability of microscopic complex systems 3=3650
Sommerfeld-Runge law in 3 and 4 dimensions 3=21
space dimensionality problem 3=7105
space-time discontinuum in $h-c-l_0$ theories 3=9328
square, visualized as curvilinear curve, physical
possibilities 3=1577
tacit knowledge, bearing on philosophy 3=7080
time and energy as conjugate variables 3=21208
triality principle, extension to globally defined
fields 3=11688
universe asymmetric behaviour in time rel. to
symmetry of physical laws 3=1

Physiology

- See also Biological technique and instruments; Blood;
Hearing; Vision.
"cold" stimulator, transistor circuit 3=9699
eye, cell maintenance and preservation 3=5289
human heart, mathematical pulsatile model 3=3644
human respiratory tract, air-borne particle
retention 3=3643
reaction times lengthened by reduced blood flow 3=21148
skin, sensitivity to vibration 3=3648
weightlessness as sense experience 3=16440

Piezoelectric oscillations

- coupling detection by r.f. spectroscopy 3=24504
crystal plates, forced vibs. 3=3844
even harmonic of thickness resonance oscill. 3=14233
infinite plate, wave propagation 3=9538
plate, static deform., natural freqs. 3=16678
plates, thickness vibs. 3=7267
quartz, AT-cut plates, r.f. vibrations 3=21470
quartz crystals, during Ag^+ and Cu^+ conduction 3=25412
quartz crystals, slotted 3=15625
quartz, visual observation of modes 3=21469
thickness-mode resonator, with electromechanical
coupling 3=7266
transducer responses, periodic step input 3=23007
transducers with transient mech. force and elec.
voltage 3=21468
CdS, coupling to acoustic wave 3=8567

Piezoelectricity

- See also Electrostriction; Piezoresistance.
ceramics, applications 3=13110
ceramics, $BaTiO_3$, for fine movement control 3=7418
current meas., bridge circuit 3=3974
and elasticity, crystals, tensor symmetry 3=17948
guanidine aluminium sulphate, inverse 3=23008
historical role in ultrasonics 3=14253

Piezoelectricity—contd

- laser beam mixing in piezoelec. crystals, nonlinear
effects 3=7359
materials, bibliography 3=13102
optical maser modulator, piezoelec. 3=3875
perovskite ferroelectrics, acoustic and X-ray
excitation 3=22993
piezoelectric crystals, Raman scattering 3=15693
polymers, appearance of charges during deforma-
tion 3=20388
polymers, organic, semiconducting 3=852
polymers, 20 natural and synthetic 3=20392
quartz, electric field, d.c., reson. freq. change, and
elastic const. change 3=23009
reflection light, harmonic prod. obs., GaAs, Te 3=18956
rubber, on vulcanization 3=25409
semiconductors, piezoelectric, absorption of
sound 3=17653
symmetry changes during direct and inverse
responses 3=20390
tetragonal crystals, Raman spectra 3=3025
transducer, electromech. coupling coeff. meas. 3=5494
transducers, spherical, prestressed electrodes 3=5504
triglycine sulphate, effect of γ -radiation 3=17949
triglycine sulphate, electrostrictive constants 3=15624
triglycine sulphate, inverse effect, a.c. field and temp.
depend. 3=28391
 $BaTiO_3$, microprobe, u.s. fields study 3=1777
 $BaTiO_3$ - $BaHfO_3$, 60-700 μ thick, d_{33} modulus 3=17939
 BeO crystals, polar character 3=10884
 CdS , meas. and model 3=8556
 $CdS:Cu$, ultrasonic transducer with diffused layer 3=9566
 $CdSe$, meas. and model 3=8556
 $CdTe$, meas. and model 3=8556
Ge, impurity cond. 3=13058
Ge, piezoresistance, review 3=2965
 KD_2PO_4 , constant 3=17943
 $KNbO_3$ 3=16033
 $LiH_2(SeO_4)_2$, piezoelectric constants 3=10881
 $NaCl$, elec. potential due to plastic
deformation 3=900
 $NaNO_2$ single crystals 3=23002
 $NaNO_2$ single crystals, -50° to $+230^\circ C$ 3=10885
 PbO - TiO_2 - ZrO_2 system 3=3255
Si, piezoresistance, rel. to pressure to
2000 kp cm^{-2} 3=2965
Si, piezoresistive pressure transducers 3=887
 TiO_2 p-n junction films 3=13127
 ZnS , meas. and model 3=8556
 $ZnSe$, meas. and model 3=8556
 $ZnTe$, meas. and model 3=8556

Piezoresistance

- See also Piezoelectricity.
semiconducting devices, recent advances review 3=22969
semiconductors, diffused layers 3=10753
 $BaTiO_3$, secondary piezoresistivity 3=10879
Ge, diffused layers 3=10753
Ge doped with As, $1.3^\circ K$ with uniaxial compression 3=10765
Ge, n-type, degenerate, valley splitting 3=10787
Ge, Sb- and As-doped, rel. to compression, 1° to
 $300^\circ K$ 3=22931
 $PbSe$, rel. to band structure 3=15594
 $PbSe$, rel. to energy band structure 3=15592
 $PbTe$, rel. to band structure 3=15594
 $PbTe$, rel. to energy band structure 3=15592
Si diffused layers, n- and p-type 3=10798
Si, n-type, resistance and Hall effect 3=15582

Piles, nuclear fission

See Nuclear reactors, fission.

Planets

See also Solar system.

- asteroid families, mean lifetimes 3=11516
Asteroid Hilda (153), orbit variations 3=16361
asteroid Thule, motion 3=1510
asteroids, Kirkwood gaps, theory 3=13867
asteroids with high inclination and eccentricity,
secular perturbations 3=5242
atmosphere, diffusion, gravit. effects 3=13647
atmosphere models, radiation transfer, scatt. 3=16339
atmosphere, non-grey, model 3=16348

Planets — contd

- atmosphere, particulate matters 3=16351
- atmosphere, reflectivity, varying "local albedo" calc. 3=16344
- atmospheres, scattering functions, tables 3=16345
- conference Liège (1962) 3=13862
- dwarf, magnetic field 3=5237
- early history, rel. to meteorite isotope shift 3=2
- exosphere, density distrib. analysis 3=16239
- ferroelectric, for moon obs. 3=16349
- gas escape, selective, kinetic theory 3=21099
- general perturbations, in rectangular coordinates 3=23669
- interior constitution, review 3=16335
- interior models, cores, thermal histories, comparison 3=16336
- Jupiter, apparent brightness temp. 3=25983
- Jupiter, atmospheric activity 3=18614
- Jupiter, chemical composition, structure 3=16337
- Jupiter, cyclotron radiation, rel. to exosphere structure 3=3621
- Jupiter, decametre radiation, polarization 3=25980
- Jupiter, decametre radio storms, theory 3=21132
- Jupiter, decametric bursts, long baseline interferometry 3=13923
- Jupiter, decametric emission, dynamic spectra 3=9268
- Jupiter, decametric radiation 1957-61 3=13922
- Jupiter, 8 mm emission 3=5273
- Jupiter 18Mc/s burst rel. to spin-flip transitions 3=7046
- Jupiter, exosphere, electron density 3=11593
- Jupiter, 5-38 Mc/s radiation 3=25979
- Jupiter, H α flashes, search 3=18609
- Jupiter, NH, lines, anomalous inclination 3=11515
- Jupiter, 1959 and 1960 observations 3=18597
- Jupiter, 1962 3=13866
- Jupiter, north equatorial belt thickness, periodicity 3=23677
- Jupiter, photometry, electronic camera, surface features 3=18612
- Jupiter, polar caps, polarization, wavelength depend. 3=16341
- Jupiter, polarized decimeter radiation, source 3=3620
- Jupiter, radioastronomy 3=18655
- Jupiter, radio bursts, decametric, polarization 3=25982
- Jupiter, radio emission at 3.3 cm 3=9271
- Jupiter, radio emission and radiation belts 3=21130-1
- Jupiter, radio emission, decimeter wave 3=7048
- Jupiter, radio emission, decametric, cause 3=18658
- Jupiter, radio emission, dynamic, repeatability 3=18657
- Jupiter, radio emission, 18 and 22 Mc/s 3=9270
- Jupiter, radio emission, 1430Mc/s, variations 3=7047
- Jupiter, radio emission, 38 Mc/s 3=9269
- Jupiter, radio emissions, decametric, mag. field configuration 3=25981
- Jupiter, radio polarization, mag. moment, correction 3=18613
- Jupiter, radiowave polarization and mag. pole-orientation 3=18656
- Jupiter, Red Spot, hydrodynamic model 3=18610-11
- Jupiter, ring, cometary and meteoritic, postulate 3=23678
- Jupiter, spectrum, CH $_4$ band variations 3=21101
- Jupiter, spectrum in blue region 3=16359
- Jupiter, 10 μ radiation measurements 3=13903
- Jupiter, three radio sources 3=18654
- layered oblate, free modes, theory 3=11495
- major, spectra energy distrib. photoelectric obs. 3=16342
- Mars, albedo 3=18601
- Mars, astrolabe obs. 3=13863
- Mars, atmosphere, NO, and blue haze 3=18598
- Mars, atmosphere, optical boundary 3=18605-6
- Mars, atmosphere, ozone 3=18608
- Mars, atmosphere, particulate matters 3=16351
- Mars, atmosphere, upper, models, deductive 3=18604
- Mars, atmosphere, water vapour meas. 3=13864
- Mars, atmosphere, water vapour, particle layers 3=18603
- Mars, average surface temp. estim. 3=7022
- Mars, composition, theory. 3=25860
- Mars, decametric radiation 3=5272
- Mars, global dimensions 3=3550
- Mars, heat balance on surface 3=9178

Planets—contd

- Mars, internal constitution 3=1514
- Mars, photometry, multi-colour program 3=16340
- Mars, precision mapping 3=23675
- Mars, probe for detecting micro-organisms 3=21102
- Mars, reflection spectra, correction 3=9179
- Mars, spectrum in blue region 3=16359
- Mars, spectrum, 3200-6100, light region, violet layer, due to scatt. 3=18602
- Mars, surface and atmosphere, from photometry, three models 3=18600
- Mars, temp., surface and atmosphere 3=18607
- Mars, upper atmosphere 3=3548
- Mars, water in free-state, amount 3=3549
- Mars, water vapour detection 3=23674
- Mars, water vapour, rel. to Fe $_2$ O $_3$ hydration equil. 3=23676
- Mercury, atmosphere, particular matters 3=16351
- Mercury, composition, theory. 3=25860
- Mercury, decametric radiation 3=5272
- Mercury, erosion, by meteoric impacts 3=16352
- Mercury, internal constitution 3=1514
- Mercury, microwave emission 3=3623
- methane, metallic ammonium, H $_2$ O and Ne, densities at planetary pressures 3=21100
- natural satellites, orbits calc. 3=5245
- Neptune, constitution 3=16338
- observations 1959-60, conference 3=9139
- optical dispersion in spherical atmosphere 3=23592
- origin 3=3544
- planet-satellite systems, mass rel. to ang. momentum 3=11585
- planetary nebulae, Zanstra's theory 3=9245
- radiation, far i.r. detectors 3=16349
- radiation, h.f., l.f. noise, obs. by nearby probe 3=16348
- radiation, microwave, as research tool, review 3=18599
- radiation, scattered solar Lyman- α and HeI obs. possibility 3=16343
- radioastronomy, review 3=18652
- radio emission, origins 3=23708
- Saturn, atmospheric activity 3=18614
- Saturn, microwave spectrum 3=5274
- Saturn, 1962 3=13866
- Saturn, photometry, electronic camera, surface features 3=18612
- Saturn, rings, B, optics and geometry 3=18615
- Saturn, 10 μ radiation measurements 3=13903
- spectra, and CH $_4$ bands, i.r. 3=15363
- sputtering rates under solar-wind bombardment 3=23667
- telescope observation balloon born, Stratoscope II 3=16350
- telescopes, refracting, objectives design 3=9141
- Uranus, constitution 3=16338
- Uranus, decametric radiation 3=5272
- Venus, apparent brightness temp. 3=25983
- Venus, apparent rot. vel. 3=11594
- Venus, atmosphere, CO $_2$ absorption 3=13865
- Venus, atmosphere, necessity for allowing for scattering 3=18621
- Venus, atmosphere, particulate matters 3=16351
- Venus, atmosphere, temp. and pressure, from CO $_2$ vibr.-rot. band 3=16356
- Venus, atmosphere, temp. distrib. 3=16357
- Venus, brightness temp. at 8.6 mm radiation 3=11591
- Venus, brightness temp. map 3=16380
- Venus, charged particles, spacecraft meas. 3=18616
- Venus, cusp, Cytherean caps, auroral origin? 3=18623
- Venus, decametric radiation 3=5272
- Venus, development, theory 3=25860
- Venus, 8 mm emission 3=5273
- Venus, 4 mm radio emission 3=3622
- Venus, 4.3 mm radiation 3=11592
- Venus, glaciation, from high albedo 3=9180
- Venus, infrared radiometry by spacecraft 3=18617
- Venus, i.r., obs. 1-13 μ 3=16354
- Venus, i.r. spectrum, atmosphere composition 3=11517.
- Venus, i.r. spectrum, photometry, 1-2.5 μ , CO $_2$ bands 3=16353
- Venus, internal constitution 3=1514
- Venus, mag. field, spacecraft meas. 3=18619
- Venus, mag. field strength 3=5244

Planets — contd

- Venus, microwave, and plasma instabilities 3=11595
- Venus, microwave radiometry by spacecraft 3=18618
- Venus near superior conjunction, 10 cm obs. 3=5275
- Venus, period of rotation, radar meas. 3=18620
- Venus, photometry 3=18622
- Venus, photometry, multi-colour program 3=18340
- Venus, polarization, wavelength depend. 3=16341
- Venus, radar obs., astron. unit determ. 3=9272
- Venus, radiative transfer in atmos. 3=21267
- Venus, radioastronomy, high-surface temp., explanation 3=21129
- Venus, radio brightness distrib. 3=16426
- Venus, radio emission at 3.3 cm 3=9271
- Venus, radio obs., 3 cm, effect of solar illum. phase 3=18653
- Venus, radius, determination 3=5243
- Venus, rotation, from radioastronomy 3=11518
- Venus, spectrum in blue region 3=16359
- Venus, spectrum, O₂ bands, search 3=16355
- Venus, temp., radio and optical data 3=16358
- Venus, temp., radio obs., enhancements 3=21127-8
- Venus, vertical distrib. of neutral gases 3=21097
- Venus, water vapour obs. 3=21098

Plasma

- See also Discharges, electric; Electrons; Ions; Space charge.
- absorption of light, in non-uniform plasma 3=5674
 - absorption of microwaves and microwave conductivity 3=14577
 - absorption of radiation by ionosphere 3=3488
 - a.c. conductivity, ion correl. effects 3=9769
 - acceleration, by parallel electrode discharge 3=19261
 - acceleration, luminous phenomenon, refl. study 3=23971
 - acceleration, with electrodeless conical ring-discharge 3=21811
 - accelerator, coaxial, particles moving against electrodyn. acceln. 3=24307
 - accelerator, particle analysis by retarding field method 3=7591
 - accelerators; electron beam scattering and electron inertia induction 3=2113
 - accumulation in magnetic traps, ultra-low pressure neutral gas 3=12107
 - acoustic compressional wave propag. 3=7548
 - adiabatic compression, choice of apparatus 3=21795
 - adiabatic invariants, approximate constancy 3=390
 - afterglow, dielectric const. 3=7550
 - air, thermodyn. equil. at high temps. 3=4118
 - air, thermodynamic equil. at $(2-10) \times 10^4$ °K 3=24275
 - air, thermodynamic parameters calc. 3=21818
 - ambipolar diffusion, in weakly ionized system 3=24282
 - anisotropy, particle velo. distribution 3=21769
 - anomalous Doppler effect 3=400
 - arc flame jet, temp. meas., in terms of Fe spectrum 3=16921
 - arc, microwave Doppler shift study 3=5645
 - argon jets, subsonic, power dissipation, temp. 3=5663
 - Astron device, energy balance 3=12200
 - axisymmetric system of charged particles 3=14756
 - beam, mag. barrier penetration, calc. 3=19423
 - beam-plasma system, electron beam generated, in neutral gas 3=21815
 - behaviour in mag. field without mag. surfaces 3=7675
 - bibliography 3=12098
 - bibliography, annotated, for 1958-62 3=9766
 - Boltzmann eqn., linearized, particular solution 3=14565
 - boundary with mag. field, location, correction 3=16307
 - bounded, collective electron instability 3=21763
 - bounded, particle dynamics 3=12220
 - bremstrahlung, generation, internal absorption 3=5682
 - bremstrahlung losses, no coherence effects 3=21789
 - bremstrahlung, nonrelativistic, Gaunt factors 3=1969
 - bremstrahlung spectrum and cond., electrical, calc. 3=14563
 - bulk-, surface-, and "string" instabilities, growth and properties 3=7538
 - bumpy torus, Ar, afterglow 3=19270
 - bunch, movement along guiding electrodes 3=399
 - bundle movement along guiding electrodes 3=19250

Plasma — contd

- charge moving in vacuum over plasma, energy loss 3=14746
- charged-particle emission, in mag. field 3=21772
- charged particle motion in alternating fields 3=387
- charged particles in cusped geometry, trajectory analysis 3=19246
- collective and collisional correlations, kinetic eqn. 3=4122
- column, in longit. mag. field, radial distrib. of various quantities 3=19235
- compression by azimuthal currents 3=7564
- conductivity and velocity meas., mag. probe 3=1995
- conductivity, high-frequency, in magnetic field 3=19244
- conductivity tensor and dispersion eqn. 3=1962
- conference, ionization in gases, Munich (1961) 3=1928
- confined, hot, high density, steady state 3=14556
- confinement by dipole mag. field rotating at 1.3 Mc/s 3=4140
- confinement by mag. and e.m. fields, device 3=21794
- confinement, configs. of h.f. e.m. and magnetostatic fields 3=4141
- confinement, e.m. trap, conditions for low-density plasma 3=19274
- confinement, electrostatic 3=19272
- confinement in helically invariant mag. field 3=21940
- confinement in Heliotron B mag. field 3=1990
- confinement, h.f. em. and static mag. fields, resonance, theory 3=14589
- confinement, reflection of high-temp. plasma by mag. field layer 3=19273
- constitutive eqns., plasma-like medium 3=21947
- containment studies, C-stellarator, coils, stresses and temp. 3=12189
- containment, three-dimensional, by orthog. standing waves 3=19428
- Coulomb interactn., in uniform mag. field 3=386
- current-layer diffusion in one-dimensional pinch 3=1989
- cyclotron instability, in uniform mag. field 3=24315
- cylindrical, in longit. mag. field radial distrib. parameters 3=4119
- cylindrical; magnetoacoustic resonance 3=397
- charged particle collision integrals in mag. fld. 3=5829
- charged particle energy losses 3=5673
- charged part. transition radiation 3=5681
- Cherenkov radiation of fast moving charge 3=12436
- coaxial accelerator, current sheet, planarity 3=7599
- coherent light transmission 3=12138
- cold, nonlinear space charge effects 3=12101
- collective description and Landau damping 3=7618
- collisions, close, kinetic eqn. 3=5650
- collision integral for charged particles in mag. field 3=5654
- columns, confined by mag. flds shock waves, longitudinal 3=7530
- in cometary heads 3=3553
- composition and energy distrib. meas. 3=7588
- compression, fast Bz, rotation and instability 3=7570
- conductivity and electron relax. rel. to radiative effects 3=5671
- conductivity, electrical, meas., by magnetic probe 3=5598
- conductivity, electrical, meas., without electrodes 3=5677
- conductivity, high-freq., in presence of direct current 3=1978
- conference, Leatherhead, (1962) 3=7450
- conference, Salzburg (1961) 3=7494
- conference, Tarrytown (1962) 3=5649
- confined, by r.f. field, self-consistent calc. 3=7555
- confinement by diffuse reflecting wall 3=9375
- confinement by mag. fields, errors 3=9801
- confinement, cusp, cylindrical multipolar 3=16947
- confinement in toroidal theta pinch 3=7569
- confinement magnetic mirrors and cusps, Ne¹⁰ tracer study 3=7568
- confinement, magnetic, motion and particle number 3=24292
- confinement, optimum energy 3=12178
- confinement, r.f., 1-dimensional theory 3=9796
- confinement, static magnetic mirrors 3=7567
- confinement transition region separating plasma from mag. field 3=7566

Plasma — contd

- confinement using alternating magnetic field 3=12146
- conductivity, in presence of a drift 3=16939
- conductivity, thermal and electrical, from temp. profile 3=7589
- conservation eqns. in presence of radiation 3=12102
- containment studies, C-stellarator 3=12187
- containment studies, C-stellarator, power supply 3=12188
- convective flexure of plasma conductor 3=21777
- converter, direct thermal to electrical 3=7423
- Coulomb interaction in uniform mag. field 3=7509
- currents bet. moving plasma and cold electrodes 3=21755
- current-voltage behaviour 3=5655
- cusp compression experiment 3=12147
- cyclotron frequency in varying magnetic field 3=2776
- cyclotron radiation 3=7607
- cyclotron radiation, by Vlasov eqn. 3=9786
- cyclotron radiation of electrons 3=12112
- cyclotron resonance in magnetic field of helix 3=12122
- cylinder in low density, moving plasma, static potl. 3=7533
- cylindrical, pinch motion 3=19262
- DCX-2, accumulation by high-energy injection 3=12203
- Debye-Hückel potential, energy levels 3=3746
- decay, by diffusion of particles in mag. field 3=14591-2
- decaying, optically thin, excited atoms and radiated power 3=21779
- dense, ionization-equilibrium eqn. of state 3=3590
- deuterium, electron density, interferometric meas. 3=7582
- deuterium, hot, production and confinement 3=12150
- deuterium, in Scylla, high-temp., X-ray spectra meas. 3=7581
- development by injection of fast particles 3=12105
- diamag. instability, large ion Larmor radius 3=7546
- dielec. permeability, spatial dispersion, relativistic isotropic plasma 3=4127
- dielectric coeff., Lorentz polariz. term 3=4112
- dielectric const., longitudinal 3=14564
- dielectric function for classical system 3=16549
- dielectric tensor of inhomog. plasma, theory 3=21787
- dielectric tensor suscept. for population inversion 3=8202
- diffraction, electromagnetic waves, conducting cylinder clad by plasma 3=19446
- diffusion, abnormal, perpend. to mag. field 3=388
- diffusion, ambipolar, in weak mag. fld. 3=7603
- diffusion, ambipolar inertia-controlled 3=5462
- diffusion, anomalous, from microinstabilities 3=5652
- diffusion anomalous, with current in magnetic field 3=14573
- diffusion charge carriers, approx. calc. 3=21761
- diffusion of charged particles in mag. field 3=21790
- diffusion decay in mag. field 3=14575
- diffusion, due to excitation of ion-acoustic oscillations 3=21842
- diffusion in mag. field, like-particle collisions 3=24286
- diffusion in mag. fld. 3=7522
- diffusion in magnetic field, effect of "drift" waves 3=24322
- diffusion in magnetic field, rel. to Coulomb collisions 3=19239
- diffusion theory, stochastic methods 3=12124
- diffusion theory in magnetic field 3=403
- diode, kinetic theory for low plasma density 3=14511
- diodes, cathode processes, as m.h.d. energy converter 3=21816
- direct conversion of electricity, appl. 3=5618
- discharge tube, sheath formation by r.f. fields 3=21800
- dispersion relations, detm. by variational technique 3=19243
- dissipation, rel. to wave propagation, growth, decay 3=7540
- double ion beam instabilities, during turbulent heating 3=16985
- drift instability, by collisional relax. of high-energy particles 3=5651
- drifted, transverse e.m. waves, instability 3=17693
- drifting, probe characteristics 3=19280
- double-stream instability, propag. 3=9775
- dynamic friction, ion wave radiation reaction 3=21762
- dynamical friction and diffusion coeffs. 3=14576
- effective collision frequencies and ω_{pe} values of electrons 3=1977
- elec. arc, electrode substance, equil. concn. 3=1952

Plasma — contd

- elec. microfield distrib. functs. 3=5660
- electric fields, singularities 3=4110
- electric microfield, quantum mech. description 3=394
- electric pot., between two electrodes, on excitation to high speeds and turbulence 3=9767
- electrical conductivity, h.f., fully ionized plasma 3=7606
- electrodynamics, linear 3=21769
- electrodynamics in uniform mag. field, quantum 3=4129
- electromag. wave radiation, plasma clad current filament 3=19438
- electromagnetic wave absorption, in const. mag. field, quasilinear approx. 3=24283
- electromagnetic waves, polarized, thermal effects, 35 kMc/s 3=9784
- electromagnetic waves, polarized, transmission and reflection, hot, mag. confined 3=19252
- electron and photon relax. in mag. field 3=22107
- electron beam, helical, self-modulation 3=7608
- electron beam, intense, instability 3=436
- electron beam interaction, energy loss 3=9780
- electron beams, effects 3=9779
- electron conductivity, rel. to velocity depend. of collision freq. 3=14763
- electron Coulomb collisions, inelastic cross-sections 3=24371
- electron cyclotron radiation, Coulomb interact. 3=7602
- electron densities, high, meas. 3=9611
- electron density and collision freq., microwave meas. method 3=1994
- electron density and collision frequencies, microwave meas. 3=410
- electron density, high impedance meas. 3=12182
- electron density, by interferometry, in Sceptre IV 3=5679
- electron density, long. var., hot-cathode Hg discharge 3=19204
- electron density meas., microwave reflection 3=12181
- electron-density profiles, mm-wave meas. method 3=19229
- electron density and temperature meas. in magnetic compression experiments 3=12158
- electron density meas. by Faraday effect 3=4150
- electron density meas. by microwave polar interferometer 3=4148
- electron density meas. techniques and apparatus up to 10^{18} e/cm³ 3=4149
- electron distrib., microwave diagnosis 3=4136
- electron distribution function, in periodic elec. field 3=24281
- electron energy distributions, anomalous exchange rate, evidence 3=24268
- electron heating at cyclotron frequency 3=12209
- electron, interactions with charges in a mag. field 3=7534
- electron-ion, negative absorption rel. to free-free transitions 3=1982-3
- electron and ion temperature relaxation, in strong magnetic field 3=14572
- electron mobility rel. to resistance 3=5633
- electron plasma, heavy charged particle heating 3=414
- electron plasma in magnetic field, dielectric permeability tensor, quantum theory 3=402
- electron plasma, periodic electrostatic fields 3=21873
- electron radiation moving in helical path 3=24308
- electrons moving in spiral, radiation 3=22106
- electron temp. meas., microwave method 3=19279
- electron temp. meas., spectroscopic 3=24303
- electron thermal motion, effects on polarizability 3=14605
- electron, turbulent elec. field fluctuations 3=389
- electron velocities, non-Maxwellian 3=4109
- electronic distribution function for anisotropic, inhomogeneous plasma, in alternating elec. field 3=7517
- electrostatic resonances of hollow plasma 3=21764
- electrostatic sound waves, collision damping 3=16929
- e.m. dispersion for Cauchy equil. distrib. 3=9794
- e.m. field amplitudes, calc., axi-symmetric problems 3=12296
- e.m. field, effective force 3=17049
- e.m. field, h.f., interact. with cylinder 3=1981
- e.m. field, 0.6 to 6 Mc/s, interaction 3=14579

Plasma — contd

e.m. interactions nonlinear, polarizing effect 3=404
 e.m. ray gradient effect on electrons and atoms 3=5834
 e.m. resonances of sphere in mag. field 3=7537
 e.m. wave absorption, quantum and classical 3=16941
 e.m. wave absorption, temp-diagram technique 3=405
 e.m. wave cyclotron absorption 3=16940
 e.m. wave excitation across plasma particle beam 3=21788
 e.m. wave guiding along magnetic field 3=9941
 e.m. wave incoherent scattering by free electrons 3=7702
 e.m. wave interaction at free space boundary 3=9789
 e.m. wave propag. along mag. field in warm plasma, theory 3=1984
 e.m. wave propag., amplitude modulation 3=500
 e.m. wave propag. and transport phenomena 3=7549
 e.m. wave propag., appl. to semiconductors 3=6568
 e.m. wave propag., energy equipartition 3=7556
 e.m. wave propag. in annular columns 3=4276
 e.m. wave propag. in beam-plasma system 3=2127
 e.m. wave propag. in magneto-ionic columns 3=501
 e.m. wave propag., limit cases 3=4132
 e.m. wave propag. near equil., without mag. fields 3=9788
 e.m. wave propag., non-linear 3=9792-3
 e.m. wave propag. normal to mag. field 3=4138
 e.m. wave refl., at indep. moving media boundary 3=5844
 e.m. wave reflection by plasma half-space 3=19253
 e.m. wave scatt. by bounded column 3=9791
 e.m. waves in plasma stream in medium of high refr. index 3=1985
 e.m. waves interaction, analysis 3=5667
 e.m. waves, matching at gradual boundaries 3=1986
 e.m. waves, negative absorption, theory 3=4137
 e.m. waves, permittivity, magnetically active plasma, with large refractive index 3=14584
 energy balance and confinement, experiments 3=12172
 energy bound 3=19245
 as energy-conversion medium 3=24271
 energy dissipation mechanisms 3=7507
 energy loss, radiation and particles, meas. separately 3=16956
 energy transfer, hot ions to cold electrons 3=12121
 equation of state, classical, high temp., low density 3=21258
 equation of state and energy-level shifts of atoms 3=14566
 equilibrium configurations of Larmor radius size 3=4116
 equilibrium of a column in a magnetic field 3=7532
 excitation, long-wavelength modes 3=12139
 exploding wires, interaction with microwaves 3=4103
 exploding wires, jacket, creation process 3=4102
 exploding wires, pinch effect 3=4139
 expt., capacitor bank, spark-gap switching 3=3972
 fast ion, thermalization, analytic solution 3=19248
 filament, current-carrying, eqns. of motion 3=21796
 flames, caloelectric effect 3=19184
 flames, intermediate gas region 3=14399
 flow, almost one-dimen, magnetohydrodyn. 3=7514
 flow at high temp., experiment and theory 3=7587
 flow, forbidden zones, theory 3=16936
 flowing, e.m. field interaction 3=16945
 flow, magnetogasdynamic, between coaxial cylinders with potential between 3=17044
 flow, quasi-one-dim., magnetohydrodyn. 3=21791
 flowmeter, absorbing 3=21802
 fluctuations 3=5653
 Fokker-Planck coefficients, including cyclotron radiation 3=12109
 Fokker-Planck coeffs. for one-dim. plasma 3=4115
 formation by h.f. e.m. fields, and pinches, orthogonal 3=14590
 free-space discharge prodn. at focal point of e.m. standing wave 3=7592
 fully ionized, r.f. probe meas. 3=7575
 G-factor, microwave detm. 3=4152
 γ -rays of discharge in mag. trap 3=7512
 gas filter for cutting off particles from radiation 3=24274
 use for gas flow visualization. 3=157
 general equation, with electrons, positive and negative ions; boundary value problem 3=7495

Plasma — contd

generation and amplification of millimetre waves, survey 3=5835
 gun, electrodeless 3=12207
 gun, fast-acting valve design 3=19285
 gun, inductive 3=21809
 "gun", mag. operated, calc. 3=9808
 guns, two coaxial, high vel. source 3=7520
 h.f., mass separation and pinch effects 3=24294
 Hall instability, slightly-ionized plasma 3=24272
 Hamiltonian and other systems, asymptotic theory with nearly periodic solutions 3=11669
 heating by collapsing magnetic fields 3=12173
 heating by e.m. fields, magneto acoustic reson. 3=7613
 heating, by polarized r.f., trapped in pulsed mirror field 3=9783
 heating, e.m. wave, circularly polarized 3=21786
 heating, in periodic elec. field 3=24281
 heating of circularly polarized waves, exptl. verification 3=16951
 helical instability of linear discharge plasma 3=12088
 high-current discharge in weak magnetic field, mechanism 3=12108
 high-energy particle magnetic trapping, ion trajectory and magnetic field calc. 3=12154
 high-energy particles, drift instabilities rel. to collisional relaxation 3=7526
 high-density, high-temp., production methods, by controlled magnetic compression 3=12163
 highly-dense, spectroscopy, short-time, methods 3=7580
 highly-ionized, neutral atom density meas. by line radiation absorption 3=7579
 high temp. prod. in jets, He, Ar 3=21602
 high-temperature, lifetime detm. on basis of neutron emission duration 3=1997
 high temperature plasma, stationary states, kinetic approx. 3=19235
 high temperature production torch, h.f. 3=7590
 historical review 3=9764
 "hot" component concn. meas. with "free" probes 3=21807
 hot-electron plasma, by beam-plasma interaction 3=16937
 hot, gas insulation, theory and expt. 3=12198
 hot, produced by electrolytic condenser bank 3=5656
 hydrodynamic eqns. 3=7497
 impulse discharge into hollow cylindrical gas sheath 3=7561
 impurity atom, life history, calc. 3=21770
 impurity introduction processes 3=12106
 impurity ions, multiply charged, heating 3=24273
 incompressible, variable acceleration, Taylor instability 3=7531
 induction torch, heat transfer 3=21593
 infinitely conductive, motion in frozen-in mag. fld, Lagrangian and Hamiltonian methods 3=12194
 inhomogeneous, in waveguide, e.m. wave propag. 3=7709
 inhomogeneous, mirror-type microinstabilities 3=1970
 inhomogeneous, scattering and conversion cross sects. 3=499
 inhomogeneous, stability in magnetic field 3=12120
 injected into cusped magnetic field, experimental studies 3=12119
 injection from pulsed discharge into vacuum 3=1996
 injection machines, potential and energy distrib. 3=1998
 injection, separation of emission light 3=12175
 instability, electromagnetic 3=7552
 instability in crossed elec. and mag. fields 3=9776
 instability, with mag. neutral point 3=7516
 instability, nonthermal plasma 3=7586
 instrument for neutral gas density meas. 3=24297
 interaction of cold plasma with guided e.m. waves 3=7553
 interaction with charged-particle beam 3=21792
 interaction with electron beams 3=9781
 interaction with electron-ion beam, gain 3=24284
 interaction with e.m. field in cavity resonator 3=12136
 interaction with external current and flux 3=7598
 interaction with radio wave at high temp. 3=7554
 interaction with resonant cavity 3=14776
 interference spectrometry, 0.1-10 mm 3=9957

Plasma — contd

- interpenetration of two ionized gas clouds 3=16907
- interplanetary, flow round earth 3=9287
- ion-acoustic waves, excitation, in periodic elec. field 3=24281
- ion beam injection into magnetic trap, electrostatic 3=7651
- ion beam neutralization by electron injection 3=12128
- ion energy and density, in e.m. trap 3=19274
- ion energy in Zeta-type device 3=1999
- in ion source, duoplasmatron, Dynamag, density 3=5717
- ion velocity distrib., relaxation eqn. deriv. 3=4111
- ionic centrifuge, current calc., new method application 3=12307
- ionization, admixture interaction effects, thermal excitation 3=24269
- ionization ahead of cylindrical shock waves 3=1759
- ionization energy reduction in thermodyn. equilib. 3=7604
- ionization eqn. for medium temp. and density 3=16933
- ionized electric fields, equations, singular and regular solutions 3=9772
- ionized gas, ion-neutral particle momentum transfer 3=21718
- instability, under charged beam interaction 3=4171
- interaction with two-dim. mag. dipole 3=4125
- irregularities in weakly ionized gas, movement theory 3=23605
- irreversible processes 3=18847
- irreversible transport phenomena, new approach 3=19242
- jet, arc stabilized by air vortex, for propulsion 3=408
- jet, arc stabilized by mag. field, for propulsion 3=409
- jet from pulsed discharge, structure obs. 3=14569
- jet, H_α and H_γ line shapes 3=2000
- jet, of generator, structure invest. 3=9809
- jet, transfer across mag. barrier, temp. meas. 3=9800
- jets, arc-heated, 5-20 kW, temp. distrib. 3=21810
- jets, high-purity, arc heating device 3=4156
- jets, pseudo-high-energy positive ions 3=7518
- jet, stable, for spectroscopic source 3=1820
- jets, stable, formation, with force-free mag. flds 3=7560
- jets, temp. meas., spectroscopic 3=4151
- jets, water-stabilized, electron density and temp. 3=2000
- kinetic coeffs, derivation 3=385
- kinetic equations, Fokker-Planck analysis, criticism 3=12110-11
- kinetic eqn. in strong static mag. field 3=5665
- kinetic eqn. in weak static elec. and mag. fields 3=5664
- kinetic eqns. for fully ionized plasma 3=16925
- kinetic props. with large radiation press. and electron-photon drag 3=21782
- kinetics, basic, theory 3=9765
- Kirchhoff's law and radiation props. 3=391
- Langmuir probe and microwave electron density meas. 3=12184
- Langmuir probe characteristics, effect of r.f. signal 3=24300
- Langmuir probe data, rapid reduction, circuit 3=5678
- Langmuir probe, electron transit-time effects 3=16952
- Langmuir probe, modulated, characteristics 3=16953
- light, meas., by guide, fibre 3=21808
- and lightning ball 3=13686
- local thermal equilibrium, validity 3=19233
- longitudinal waves in mag. field-plasma interface 3=14578
- Lorentz gas, complex conductivity model 3=1625
- Lorentzian, electron distrib. function analysis 3=369
- low pressure, electron behaviour and beam scattering, mechanism 3=7500
- luminous phenomena when ionized air channel exploded 3=4124
- Luxembourg effect, in free space columns 3=9805
- macroscopic characteristics 3=19275
- mag. confinement, turbulence 3=9802
- magnetic annular arc 3=1954
- magnetic compression, amplitude and polarity effects 3=12165
- magnetic compression, dynamical behaviour, theory 3=12167
- magnetic compression, fast, density distrib. meas. 3=12166
- magnetic field excitation by hydrodyn. motions 3=21843
- magnetic field meas., Zeeman-effect 3=16955

Plasma — contd

- magnetic field (990 kc/s) penetration in H plasma 3=14585
- magnetic field, solenoidal, and stream, interaction 3=24288
- magnetic field topology for thermal insulation 3=21793
- magnetic mirror configurations, stability, rel. to conducting wall 3=12205
- magnetic mirror geom., pitch angle diffusion 3=9810
- magnetic probe meas., errors 3=9804
- magnetic probe, multicoil 3=16954
- magnetic shock waves 3=7529
- magnetic "surfaces" in cylinder and curved stellarator section 3=14724
- magnetically compressed, characteristics rel. to trapped field 3=12156
- magnetized, current-carrying; energy conversion mechanism 3=7527
- magnetoacoustic resonance, mag. fld. spatial amplification 3=7544
- magnetoacoustic wave absorption, in const. mag. field 3=24283
- magnetoacoustic waves in cylindrical column 3=7545
- magnetohydrodynamic toroidal system with scalar pressure, stability criterion 3=12129
- magnetomechanical effect, rotational, at low press. 3=21781
- magnetoplasma, electronic thermal cond. meas. 3=5668
- magnetoplasma halfspace, field of horiz. mag. dipole 3=21978
- magnetoplasma in a.c. field, transport coeffs. 3=9774
- magnetoplasma, microwave radiation 3=12115
- magnetoplasma, radiation from moving charge 3=24270
- magnetoplasmas, microwave reflection 3=24289
- magnetosphere, energization theories 3=13699
- Maxwell's eqns. for cold plasma, solution 3=382
- meas., transients, by reflection e.m. waves, pulse 3=24301
- measurement, cavity method 3=19278
- measurement, density, by refractive index, laser interferometer 3=19276
- metallic, gaseous, equation of state 3=16927
- metals, slowing-down of protons and μ^+ 3=22691
- microfield, theory, Holtsmark-like distrib. function 3=12095
- microwave diagnosis, electron distrib. 3=4136
- microwave diagnostic system, multiple-probe 3=4153
- microwave interacts. 3=21488
- microwave meas., use of focusing lenses 3=7576
- microwave noise emission, thermal 3=1968
- microwave propag. with parallel mag. field 3=7551
- microwave radiation 3=7536
- microwave reflection from small-diam. columns 3=21785
- microwave resonance in hot column 3=9782
- microwave scattering, harmonics predicted 3=232
- microwave transmission meas. of electron props. 3=9795
- migration across mag. field, transport theory 3=21774
- millimetre wave noise 3=4131
- mirror instability for finite particle gyro-radius 3=12152
- mirror machine experiments and atomic cross-section meas. 3=12204
- mirror machine, fusion reactions, self-sustaining, critical conditions 3=14601
- in mirror system, trapping and containment 3=16948
- mm-wave diagnostics 3=19230
- model, one-dim., numerical expts. 3=9770
- modern kinetic theory 3=7496
- motion in curved mag. field 3=19267
- motion in front of shock wave 3=18897
- motions in e.m. field, non-stationary, calc. 3=12135
- moving, electrical impedance of immersed electrodes 3=21760
- moving, e.m. wave reflection, theory 3=12141
- moving, nonlinear mag. interaction effects 3=9773
- multicharged ion behaviour, in const. elec. field 3=4117
- multicomponent, ohmic heating, theory 3=1966
- multi-component, single-fluid m.h.d. eqns., Ohm's law 3=21783
- negative radiation temperature at cyclotron resonance 3=9787
- neutrino pair emission by hot plasma, calc. 3=7824

Plasma — contd

neutron energy spectrum, D, cyclotron heated, mag. mirror 3=19913
 nitrogen, conductivity, thermal and electrical 3=7589
 noise radiation and scattering from cylindrical column 3=383
 noise spectrum of column in longitud. mag. field 3=24285
 nondissipative, Hamilton's variational principle 3=19234
 non-equilib., cylindrical, noise power radn. 3=4130
 nonequilibrium, density fluctuations 3=13771
 non-isothermal, correlations 3=21767
 non-isothermal, kinetics 3=7501
 non-isothermal, magnetohydrodynamic single fluid eqns. 3=4126
 nonthermal, electrostatic potential gradients 3=4120
 non-thermal, spectroscopy, problems 3=7504
 number densities, a.c. and d.c. components, microwave meas. 3=21803
 Nyquist formula, Debye length and microfield 3=7525
 Ogra, cyclotron and thermal radiations 3=12202
 OGRA, electron loss rate, anomalous 3=21812
 in Ogra, formed by H_2^+ fast ion beam injection 3=12201
 "Ogrenok" trap, adiabatic 3=14602
 ohmic heating by condenser discharge 3=7600
 optically thick in red regions 3=16924
 optically-thick; spectral line-shape detm. 3=7578
 optically thin, temp. and density meas., spectroscopic techniques 3=7577
 optical study, Mach-Zehnder interferometer 3=12183
 optically thick, atomic ion recomb., theory 3=364
 "Orekh" magnetic temp. behaviour 3=12148
 P.I.G. reflex generator, pulsed, linear 3=19259
 P.I.G. reflex generator, pulsed, toroidal 3=19260
 parallel-plate capacitor, impedance at h.f. 3=24266
 particle distrib. fluctuations, theory 3=5669
 particle propag. in fully ionized plasma, theory 3=7510
 Penning discharge, thin sheath near anode 3=7453
 Pharos, compression expt., temp. and density meas. 3=7563
 PHAROS, high-energy magnetic compression experiment 3=12159
 physically bounded, current density 3=1874
 pinch, azimuthal, radial contraction 3=12143
 pinch, Carididi, orthogonal, obs. 3=12169
 pinch discharge, alternating, stability 3=12171
 pinch, equilibrium, effect of finite cond. 3=9803
 pinch expt., stabilized, long linear 3=21801
 pinch instabilities 3=21949
 pinch instability, sinusoidal, growth 3=2107
 pinch, linear, shock wave, collisionless 3=14586
 pinch, linear, end effects 3=12170
 pinch, linear, instabilities, optical obs. 3=5676
 pinch, 1-dimensional, current-layer diffusion 3=14587-8
 pinch, orthogonal, meas. 3=12168
 pinch, orthogonal, "quasi relativistic" electron layers 3=14590
 pinch, orthogonal, Schlieren photography 3=7585
 pinch, rotating, axisymmetric stability 3=9797
 pinch, stability with anisotropic pressure 3=12144
 pinch, sustained and diffuse, time const. 3=24293
 pinch, θ , coil, with edge effect compensation 3=19264
 pinch, θ , light scattering, using maser, optical, ruby 3=19256
 pinch, θ , neutral gas effects, H 3=19271
 pinch, theta, study using mag. pick-up loops 3=12145
 pinch, tubular, stability 3=14593
 pinch, z, analogy with cavity co-axial, reson., and TE_{0mn} modes 3=19441
 pinched viscous, stability 3=7562
 pinches and rings, stabilization, focusing technique 3=24295
 pinches, streak-camera record superposition 3=7584
 plasma gun coaxial 3=12197
 plasma-loaded waveguides, mode coupling 3=9935
 "plasma-scope" 3=12127
 plasmoid, e.m. field interaction, resonance 3=24290
 plasmoid rotation in theta-pinch 3=5675
 plasmoid sources, conical 3=14567
 plasmoids, in spatially periodic mag. field 3=7547
 plasmoids, generation and accel. 3=21780
 plasmoids, microwave probing method 3=24302

Plasma — contd

plasmoids, moving in mag. field, stability and containment 3=21784
 plasmon frequency, dispersion coeff. 3=6501
 plasmons, higher random phase approx. 3=16553
 positive column electron density distrib., microwave meas. 3=4147
 positive column, electron diffusion by temp. gradient 3=12100
 positive column, non-contracted, negative ion effects 3=1971
 positive column, rel. to negative ions 3=7495
 positrons, containment in asymmetric mirror geometry 3=12199
 power generation, conference 3=21966
 probe characteristics, drifting plasma 3=12180
 probe curves, second deriv. automatic plotting 3=12185
 probe, Langmuir chars., display, circuit 3=14800
 probe, Langmuir, dynamic studies, review 3=1993
 probe, magnetic, coil alignment, mechanical 3=14599
 probe, magnetic, for high-density meas. 3=7583
 probe meas., exptl. errors 3=24299
 probe meas., penetration of ion sheath 3=24298
 probe meas., rel. to diffusion loss 3=7573
 probe, negative characteristic in a magnetic field 3=5634
 probe theory at medium and low pressures 3=4154
 probes on space vehicles, rel. to ionospheric meas. 3=7571
 probes, with non-uniform work function, theory 3=7572
 produced by button-type source, mag. field behaviour 3=9777
 production by e.m. driven shock waves, review 3=7684
 production by neutral-atom injection, eqns. and numerical solns. 3=1964
 pulsed reflex discharge, equilibrium mechanism 3=4041
 pulsed reflex discharge, P.I.G. type, high-density 3=4042
 pure, high-temperature, in quasi-stationary systems, production 3=12106
 quantum, diamag. suscept. for arb. disturbances 3=19231
 quantum, h.f. e.m. absorpt. in mag. field 3=14580
 quantum, transport coeffs., Green function method 3=21759
 radial distrib. in positive column in mag. fld. 3=19240
 radiation, admixture interaction effects, thermal excitation 3=24269
 radiation by charge moving near cyclotron resonance 3=19255
 radiation by impurities, hot rarefield 3=12137
 radiation from line source 3=7601
 radiation laser, emission and pumping, review 3=22007
 radiation, l.f., by ions and electrons in mag. fld. 3=16938
 radiation, microwave, from non-Maxwell plasma 3=5657
 radiation, nonthermal impurity, from spherical plasma 3=7605
 radiation of high-temp. collision-dominated plasmas 3=7506
 radiation temperature in mag. field, r.f. meas. 3=4121
 radiation, vacuum, u.v., after mag. compression 3=7505
 radiative transfer, resonance lines, Doppler-broadened 3=9813
 radiative transfer, without thermal equil. 3=14582
 radio frequency slow mode propag. 3=12134
 rare gas, cylindrical, pulsed, confinement 3=7558
 rarefied, high-temp., convection instability and stabilization effect 3=1979
 refraction, microwave, cylinder, parabolic density profile 3=12140
 relativistic, cyclotron and aperiodic instabilities 3=5659
 relativistic virial theorem 3=24291
 relaxation phenomena 3=21757
 relaxation phenomena, unified theory 3=21758
 resistance, variable, for generation, up to 400 A d.c. 3=9694
 resonance plasma and electron density meas. 3=19251
 resonance rectification meas. using probe 3=21805
 resonance study, rel. to freq. and diam. 3=7611
 resonant behaviour, hollow, cylindrical plasma 3=9771
 resonator, eigenfreq. and damping eval. 3=9807
 review of recent work at Conference, Salzburg, Sept. 1961 3=384
 r.f. probe, resonance phenomena, theory 3=21806
 r.f. propag., in uniform mag. field 3=4133

Plasma — contd

- r.f., Schlieren photography 3=4146
 in ring discharge, electrodeless, pulsed, with mag. bias flds. 3=7499
 rotating, confined, momentum balance 3=9798
 rotating cylindrical config., stability 3=14571
 rotating, homopolar type, instabilities 3=21732
 rotating partly ionized, interaction with neutral gas 3=12118
 rotating, production in Homopolar V 3=4157
 rotation produced by electrodeless gun 3=9799
 scattering, electromag. waves, including collisions, calc. 3=16942
 scatt. theory, mag. induced anisotropy and inhomogeneity 3=393
 scattering of e.m. waves by bounded plasma 3=9790
 scattering, e.m. waves, peaks, minor, microwaves, and e density meas. 3=19254
 Scylla magnetic compression experiment, stability and heating studies 3=12206
 Scylla I theta-pinch, X-ray spectrum 15-25A 3=24296
 seeded flame, elec. conductivity, in strong elec. fields 3=19241
 self-constructed, theory, new data 3=12157
 semiconducting, non-linear effects, dispersion theory 3=10744
 semicond., oscillator phenomena 3=2879
 semiconductor, growing helical density waves 3=8504
 semiconductor, pinched, moving, Doppler effect, e.m. waves 3=17827
 in semiconductors, helical instabilities, calc. 3=13651
 sheath coating cylinder, plane wave scatt. 3=7703
 sheath study with electron-beam probe 3=7574
 sheaths, one-dimensional, distrib. calc. 3=406
 "sheet," one-dim., elec. field statistics 3=11713
 sheet pinch, finite-resistivity instabilities 3=12177
 shock tube, discharge between coaxial cylinders, velo. meas. 3=14252
 shock-tube wave phenomenon, fast dynamical 3=1955
 shock wave, collisionless, in weak mag. field 3=12132
 shock wave propag. in unpinch geom. 3=1991
 shock-wave structure, bimodal distrib. 3=21489
 shock waves, e.m. driven, radiative attenuation 3=1758
 shock waves in high temp. dense plasma 3=5661
 shock waves, strong, in transverse mag. field 3=7541
 shock waves, strong, similarity solution 3=7542
 shock waves, two-fluid model 3=1973
 shock waves, weak, structure 3=1980
 shread (plasmoid) formation in mag. fld 3=7524
 slow waves, dispersion 3=5850
 solar, Mariner II expt. 3=7028
 solids, acoustic wave amplification, u.s. 3=22633
 solid-state, transverse instabilities under steady elec. and mag. fields 3=25258
 sources, hydrogenous, highly ionized, design and construction, 3=24306
 space charge sheath, elec. field 3=12113
 space-charge wave propag. const. rel. to hydrostatic pressure 3=398
 space charge waves, collision damping, calc. 3=5666
 spatially inhomogeneous, microscopic instabilities, kinetic examination 3=12125
 spectra, two types of atoms 3=9812
 spectral cinematographical methods, development 3=7327
 spectral line self-absorption, extension of limits of applicability 3=19282
 spectrochemical analysis. 3=25841
 spectroscopic meas. of temp. and density 3=9806
 spectroscopy, high-density corrections 3=1961
 stability criteria, Lyapunov 3=12117
 stability, gravitational, effect of finite resistivity 3=21778
 stability, hydromag., rel. to mag. surfaces 3=1975
 stability in inverse pinch discharge 3=1992
 stability, in mag. field, inhomog. plasma 3=24314
 stability, in mag. field, rarefied l.p. plasma 3=24313
 stability, low pres. plasma, no mag. surfaces 3=14594
 stability, potl. energy in mag. field 3=14596
 stability, rel. to near-by equilibria 3=12131
 stability, with frozen-in nonuniform mag. field 3=7515
 stabilization, dynamic, passing current, effect of mag. field 3=7513

Plasma — contd

- stabilization of "universal" instability in weakly non-uniform plasma bounded by a mag. field 3=14595
 stable, in discharge of inverse-pinch type 3=21765
 Stark broadening of heavy-element isolated spectral lines 3=701
 stationary, diffusion in mag. field 3=12123
 stationary flow, in mag. field, finite amplitude wave 3=24280
 steady-state, highly-ionized, prod. device 3=7593
 stellarator, interchange instability 3=19284
 stellarator, loss of charged particles 3=12153
 stellarator, Model C, containment time 3=12190
 stellarator S-1, with helical magnetic fields 3=19283
 stopping power for fast charged particle 3=12103
 stratification waves, physical mechanism 3=9735
 stratified, as model of ionosphere for e.m. wave reflection 3=16256
 streaming through magnetic dipole field 3=16935
 streams, three dim.-less parameters 3=12244
 strongly ionized, in hollow cathode discharge 3=21773
 sun, flares, electron density, from cosmic ray proton interactions 3=11546
 superbarrier reflection 3=4210
 supersonic flow fields in r.f. excited plasma tunnel 3=24305
 TA 2000 torus, impurity ion far u.v. emission 3=5680
 temperature distrib. between particles for partial ioniz. 3=24267
 temperature equalization rate 3=14604
 temperature, second maximum due to admixture interaction 3=24269
 theory of fully ionized column with external particle prod. 3=9768
 thermal arc, use as known radiation source 3=10447
 thermal radio radiation 3=12133
 thermionic converter, resistance 3=4155
 thermionic generator with ion injection 3=7421
 thermoelectric power meas., low temp. 3=19277
 thermonuclear, mass analysis of neutral flux 3=24996
 thermonuclear reactions, controlled, Harwell work since 1958 3=7597
 θ pinch, added hexapole mag. flds and preionization effects 3=19266
 theta-pinch configs., wall-stabilization effects 3=21798
 theta pinch, conical, azimuthal mag. field 3=21797
 θ pinch, containment 3=19265
 theta pinch, electron density and mag. field distrib. 3=12178
 theta-pinch, fast 3=12160
 theta pinch, hard X-rays emission before breakdown 3=12179
 theta pinch, mag. fld. diffusion thru initial stages 3=7565
 Θ pinch, neutron prod. without reversed trapped field 3=4144
 theta pinch, rotational instability 3=21799
 thetatron, reversed field heating, calc. 3=413
 three-component, energy dissipation, mag. field depend. 3=21783
 three-component system, transport properties 3=16928
 toroidal apparatus, field error elimination 3=21814
 toroidal β device, electron spectrum, and O emission min. 3=21817
 toroidal current-carrying, equilib. 3=19268
 toroidal discharge excited by travelling e.m. fld., instability 3=5670
 toroidal discharge with rapid programming 3=19247
 toroidal discharge in varying longitudinal mag. fld. 3=12208
 toroidal magnetohydrodynamic stability 3=16949
 toroidal metal tubes, disturbing mag. fields at gaps 3=21813
 toroidal, m.h.d. stability, energy integral 3=21775
 toroidal pinch discharge, mag. field, temp variations 3=5637
 toroidal pinch expts., rel. to ignitrons 3=4143
 toroidal, stability 3=12130
 torus, elliptical, equilibrium, magnetohydro-dynamic 3=19258
 Torus TA2000, ionization 3=7595
 torus with surface currents, stability calc. 3=1976
 transient pinch, similarity solns. 3=19233
 transport and containment, in high-freq. and magnetic wave-guides 3=12174
 transport coefficients for fully ionized plasma 3=7508

Plasma — contd

- transport coeffs. det. by Grad method 3=14568
 transport phenomena, radiation process effects 3=14583
 transport props., radially constricted 3=16926
 transverse motion in magnetic fields 3=12127
 trapping in radially increasing magnetic field 3=12149
 trapping instabilities in slight inhomog. plasma 3=1988
 turbulence 3=7523
 turbulence in r.f. discharge 3=7470
 turbulent, elec. conductivity 3=1963
 turbulent, electrodynamic props. 3=16932
 turbulent heating by e.m. wave absorption 3=1987
 turbulent processes, quasi-equilib., kinetic description 3=396
 turbulent processes, quasi-equilib., kinetic description 3=5662
 two plasma collision 3=12126
 u.s. absorpt. in crossed elec. and mag. fields 3=9778
 u.v. spectroscopy, high-temp., review 3=14337
 unstable, kinetic eqn. 3=21833
 unstable, 2-particle correl. function 3=21766
 vacuum u.v. radiation physics, conference 3=5515
 valve, fast gas, for injection expts. 3=4158
 velocity shear in mag. field, eddies 3=1965
 virial theorem 3=7543
 viscous rotating, boundary effects 3=16934
 Vlasov eqn., integration 3=7511
 Vlasov, transverse e.m. waves theory 3=14581
 Vlasov, transverse waves in ext. mag. field 3=14582
 vortex rings, exptal. evidence and theory 3=395
 wall stabilization effects in theta-pinch configurations 3=412
 wave phenomenon, fast dynamical, in shock tube 3=1955
 wave propagation, quasi-one- fluid theory 3=9785
 waveguide filled with plasma, excitation 3=7712
 waveguide, nonlinear theory 3=19455
 waveguide, plasma-filled, wave structure 3=24476
 waveguide, wave propag. and electron beam interaction 3=7707
 waveguides, plasma-filled, fast wave propag. 3=2129
 waves, self-similar, one-dimensional, along mag. fld. 3=5672
 weakly ionized, stability in uniform mag. field 3=14574
 "weakly" unstable, finite Larmor radius stabilization 3=12151
 X-ray spectr. meas. at high temp. 3=7503
 z-pinch compression, non-cylindrical, dense, high-temp. 3=12162
 z-pinch discharge, numerical calc. rel. to magnetic probe meas. 3=12161
 Zeta, electron temp. and density rel. to pres. and mag. fld. 3=7594
 Zeta, radiation 0.1-2.0 mm wavelength, spectrosc. investig. 3=7594
 A jet, elec. and optical studies 3=24276
 A, temperature spectroscopic 3=7502
 Ar, absorption coeff., continuous, 4000-7000 Å, 8000-24 000 Å 3=1972
 Ar, bumpy torus, afterglow 3=19270
 Ar, deionization in magnetic field 3=19249
 Ar, gun 3=19238
 Ar, metastable, excitation of N₂ 3=8263
 Ar, partition functions, thermodynamic props. 3=21819
 Ar, quenching by SF₆, electronegative seeding 3=19237
 Ba, production 3=392
 Bi, solid state, cyclotron resonance, and Alfvén wave damping 3=4854
 Cs, conductivity, electrical, effect of electrode film barriers 3=21820
 in Cs diode, mag. field effect 3=19166
 Cs, disintegrating, volume recombination 3=24278
 Cs, effect on thermionic energy convertor 3=24206
 Cs, electrode work function, rel. to thermodynamic chemical potential 3=21820
 Cs, electron mobility, scatt. cross-sections 3=12186
 Cs, quiescent, steady-state generation 3=4107
 Cs, recombination, electron-ion, higher densities 3=21821
 Cs-seeded plasmas, elec. cond. meas. near thermal equilb. 3=24279
 Cu vapour wrapped with N or Ar, contraction and emission 3=7557

Plasma — contd

- D, from high vel. plasma guns 3=7520
 D, highly ionized, prodn. for compression experiments 3=12164
 D in Thetatron discharge, rapid axial contraction 3=12155
 D₂, highly-ionized, steady-state, development and study 3=7498
 H, anomalous resistance 3=12114
 H, cool, recomb. and ionization rates 3=21771
 H, energy emitted in spectral lines at equilibrium 3=19232
 H, highly ionized, generation devices 3=1967
 H line broadening in arc and shock tube 3=18861
 H, profiles of Stark-broadened Balmer lines 3=8176
 H, pure, prod., by mag. filtration 3=21822
 H, run-away electrons meas. 3=12104
 H, spectra, line asymmetry 3=12753
 H₂ discharge, motion of striations 3=19196
 H₂, fully ionized, dispersion relations 3=4123
 H Balmer line Stark broadening 3=4108
 He-Cs, microwave diagnostics, up to 3000° K 3=4135
 He, decaying, ionization processes 3=14517
 He, electron-gyrofreqn. harmonics emission 3=7465
 He, in theta pinch, electron temp. meas. 3=12142
 He, ion recombination in mag. field 3=14603
 He pinch, linear, spectroscopic meas. 3=7559
 He, recombination 3=4106
 He shock waves, electron density and temp. 3=1752
 Hg cylindrical column, noise radiation and scattering 3=383
 Hg, electron mobility, temp. var., transport cross-section effects 3=19236
 Hg, number densities, a.c. and d.c. components, microwave meas. 3=21804
 Hg vapour, low-pressure, electron and ion density hysteresis effects 3=24287
 InSb, electron-hole, thermal pinching 3=25261
 in InSb, injected, in longit. mag. flds 3=10821
 InSb, self-pinched distrib., microwave probe obs. 3=25366
 Kr, anode-glow mode, negative resistance rel. to Ramsauer effect 3=5635
 Kr, local by applied magnetic fields, effects 3=12116
 Kr, shock produced, coupling of microwaves 3=16943-4
 Kr II line broadening meas. 3=10454
 N IV ions collective motion, spectr. meas. 3=24304
 Na, production 3=392
 Na, solid, self-pinch instabilities 3=16950
 Ne II line broadening meas. 3=10454
 Ne(78%)-He(22%), low-pressure, weakly ionized, electron mobility 3=14525
 Ne-Hg, meas. of temp. and electron density 3=14597
 N₂ azimuthal discharge, whirl-like columns 3=4142
 N₂ jet, anode spot movements 3=14539
 O arc, Stark-broadened spectral lines, shifts and widths 3=24277
 Si p-n junctions, micro, at crystal dislocations, stair rod 3=20351
 Ti gun with hydrogenated electrodes, spectrum 3=7519
 Xe, anode-glow mode, negative resistance rel. to Ramsauer effect 3=5635
 Xe, high-pressure, radial temp. and mobility 3=19192
- Plasma oscillations**
 acoustic oscillations, quantum theory 3=4114
 acoustic wave propagation, ultrasonic 3=4113
 adiabatic waves associated with non-diagonal pressure tensor terms 3=12215
 Alfvén's waves, instability 3=5822
 in alkali halides, optical data evidence 3=10908
 with amplitude-depend. freqs. 3=12212
 analytic methods and approximations 3=21954
 anisotropic, longitudinal, dispersion eqn. 3=24309
 anisotropic plasma, collective energy losses 3=5684
 anisotropic plasma, instability 3=7624
 attenuation, nonlinear theory 3=2006
 axisymmetric nonlinear oscill. of cylinder 3=9822
 backward wave mode, tubular plasma 3=19257
 with charged-particle emission 3=21772
 collision damping, by Guernsey's eqn. 3=16957
 collisional damping 3=7619
 collisional damping 3=24311
 collisional damping, 2-particle distrib. function 3=19290

Plasma oscillations — contd

- column, cylindrical, magneto-acoustic 3=16966
- conducting string in mag. field, stability 3=24324
- conduction electrons in liquid metals 3=23903
- in corona discharge tubes 3=21745
- coupling to e.m. waves at boundary 3=9818
- current density in magnetic field 3=24326
- cyclotron instability, anisotropic ion vel. distrib. 3=21830
- cyclotron resonance absorption, line shape 3=2003
- cyclotron resonance, ion, frequency sweep detect., Heliotron B 3=24323
- cyclotron wave nonconvective instability 3=4162
- DCX-1, radiation and ion energy distributions 3=12196
- damping of quantized longitudinal electron oscillations 3=4169
- dark, plasma, ionic waves, longitudinal, excitation 3=4161
- deuterium cylindrical plasma, hydromag. waves 3=19291
- dielectric permeability, high-frequency 3=416
- dielectric theory, extension to exciton problem 3=25256
- diffusion from stellarator 3=12195
- diffusion waves, stationary in longitudinal mag. fld. 3=21841
- dipole resonance, in magnetic field 3=21839
- "drift", effect on diffusion, in magnetic field 3=24322
- drift instabilities rel. to resonant particle energy absorpt. 3=21846
- drift instability, non-uniform plasma in a mag. field 3=16960
- drifting plasma, low-frequ., theory 3=24319
- e.m. fluctuations with and without strong magnetic fields 3=417
- e.m. wave excitation when electron vel. is directed rel. to ions 3=21849
- electric field fluct., turbulent, in electron plasma 3=24310
- electroacoustic wave, quasisteady approach 3=24320
- electrodeless discharge, pulsed 3=14542
- electron beam energy losses in 32 solid cpds. 3=2780
- electron-beam excited, l.f. and h.f. correl. 3=19293
- electron beam interaction in mag. field 3=21847
- electron beam interaction in mag. field 3=21848
- electron beam prod., dispersion relation 3=21832
- electron and ion, low-voltage beam-controlled devices 3=14608
- electron and ion resonance, review 3=7616
- electron gas, rel. to i.r. divergencies 3=7149
- electron-ion, two-stream instability 3=22915
- electron-phonon systems, non equilibrium, in external magnetic field 3=16967
- electron resonances in mag. field, meas. 3=7614
- electron wave - e.m. wave coupling 3=11213
- electrostatic, spectrum, in strong mag. field 3=16959
- excitation near ion cyclotron frequ. 3=9819
- experiments using low-voltage electron beam 3=14607
- external electric field effects 3=21826
- extraordinary wave dispersion eqn. 3=2008
- fluctuation development with unstable distrib. function 3=5685
- frequencies, for ellipsoidal plasma 3=9821
- frequency det., gas trapping efficiency, plasma temp. 3=2004
- frequency rel. to surface diffusivity, from e.m. scattering analyses 3=16961
- Gaussian equil. density distrib., vibr. 3=9815
- glow, moving striations rel. to metastable atoms 3=4164
- growing transverse waves in a magnetic field 3=14606
- in hot cathode discharge tubes, radiation 3=7536
- hydrodynamic and magnetoacoustic waves, effect of particle colls. 3=4126
- hydromagnetic wave propag. near ion cyclotron resonance 3=19291
- inhomogeneous medium, scattering and conversion cross-sections 3=499
- inhomogeneous plasma, in mag. field 3=24314
- initial value problem for longitudinal and transversal oscillations 3=4159
- injected in Ge 3=25257
- instabilities in plasma-beam system in mag. field 3=7625
- instabilities induced by resistivity gradients 3=16965

Plasma oscillations — contd

- instability, drift, in helical mag. field 3=21829
- instability in magnetic mirror trap, exptl. 3=12214
- interaction of monoenergetic beam, nonlinear theory 3=21845
- interactions, with charged-particle beam, at l.f. 3=4171
- ion-acoustic oscillations, diffusion across mag. field 3=21842
- ion acoustic waves, propag. and damping 3=4128
- ion cyclotron waves, excitation and propag. 3=7622
- ion plasma wave, h.f. propag. 3=4163
- ion waves, l.f. inhomogeneous plasma 3=16964
- Krook equation with elec. forces, Green's function 3=12221
- Landau damping, nonlinear, bounded plasma 3=21823
- Landau damping, 1-dimensional plasma 3=21825
- Landau damping, physical derivation 3=14609
- Landau damping, rel. to collective description 3=7618
- Landau damping, rel. to plasmon-electron interact 3=391
- Landau damping, relation to energy absorption 3=7617
- longitudinal, nonlinear, stability calc. 3=14613
- longitudinal, propagation, rel. to thermal effects and collisions 3=7539
- longitudinal, resonance frequ. in finite plasma 3=2001
- longitudinal waves, dispersion reln. 3=7509
- longitudinal waves excitation in bounded plasma 3=21828
- low frequency, interaction with fast particles 3=24317
- low-frequency, in mag. field 3=9823
- low-frequency waves in unbounded plasma 3=21837
- m.h.d.-e.m. wave coupling at discontinuity 3=16963
- MHD wave, fast, above ion cyclotron frequ., meas. 3=5683
- mag. field, long., dispersion relations, calc. 3=19292
- in mag. field, stability criterion 3=14611
- magnetoacoustic and electron waves, theory 3=16958
- magnetoacoustic resonance, heating 3=7613
- magnetoacoustic, resonance, high field amplitude 3=21831
- magnetoacoustic waves absorption 3=24327
- magnetostatic waves 3=14612
- meas., by reflection, e.m. waves, pulse 3=24301
- in metal films, radiation absorpt. 3=12952
- metal films, resonance due to fast electron 3=8407
- metals, magnetoplasma, anomalous skin effect 3=8411
- metals, magnetoplasma reson., l.f., meas. 3=8409
- microwave radiation from dense plasmas 3=7535
- microwave scattering from unstable plasma waves 3=4168
- multi-species, natural resonances in external mag. field 3=4170
- by neutral atom injection, ALICE mag. mirror 3=16969
- nonconvective instabilities, damping, r.f. probe meas. 3=7575
- nonlinear, propag. along mag. field 3=7623
- nonlinear stationary waves, relativistic plasmas 3=21824
- non-linear travelling-wave perturbations 3=19289
- in non-steady state, electromag. fluctuations, theory, contrib. 3=4172
- non-uniform plasma, low-pressure, in mag. field 3=19288
- P.I.G. discharge, standing wave modes 3=21733
- P.I.G., discharge standing wave, theory 3=21734
- particle beam, charged, excitation, nonlinear theory 3=5687
- particle dynamics in bounded region 3=12220
- perturbations with Cauchy equilib. distrib. 3=12222
- pinched, azimuthal, "m=3" instabilities 3=12211
- plasma-beam system, magnetodynamic instab. 3=21834
- plasmoids, r.f. potentials, 15 Mc/s 3=4167
- plasmons, analogy with vector boson theory 3=9368
- propagation, growth, decay, rel. to dissipation 3=7540
- quantum, diamag. suscept. for arb. disturbance 3=19231
- quantum mech. effects and dispersion reln. 3=7615
- quasi-linear theory 3=12217
- quasi-linear theory 3=21827
- r.f. signal phase modulation by plasma fluctuations 3=4134
- radiation by phase oscill., Cherenkov-like 3=16962
- rarefied, kinetics, quasilinear approx. 3=2007
- reflection and refr. of hydromag. waves 3=483
- relativistic dispersion relations 3=7612
- relativistic effects and two-stream instability 3=7620-1
- resonance densities in cylindrical column 3=21835
- resonance, different from plasma freq. 3=14610

Plasma oscillations—contd

- resonance interaction with rotating mag. field 3=12223
- review, nonlinear mathematical theory 3=19287
- runaway electron stream, longitudinal oscill. 3=9814
- self-excited surface, 40-300 Mc/s 3=21840
- in semiconductor diodes 3=25379
- semiconductor, PbTe, helicon 3=13079
- semiconductors, electron-hole, and fluctuations, electrical, l.f. 3=20281
- in semiconductors, helical instabilities, calc. 3=13051
- semiconductors, nonpolar, electron-hole plasma 3=15476
- in semiconductors, rel. to electron-hole instabilities 3=10730
- in sheath study with electron-beam probe 3=7574
- shock generation in collapsing cylindrical shell 3=12219
- shock wave instability, anisotropic, rarefied plasma in mag. field 3=16930
- shock waves in collision-free plasmas 3=12216
- shock waves, nonequilibrium phenomena 3=16695
- shocks, converging, theory 3=12218
- slab condenser system 3=7610
- solar corona 3=23704
- solids, helical instabilities, theory 3=8410
- sound, in pinch effect, InSb, InAs, at sufficiently high currents 3=6597
- sound waves, ionic, meas. and appl. 3=5658
- stability, l.f., in nonuniform mag. field 3=9816
- stabilization of "universal" instability in weakly non-uniform plasma bounded by a mag. field 3=14595
- temperature disturbance with drift velocity 3=24321
- thermodynamic waves and mag. field excitation 3=21843
- Touks-Dattner reson., radial standing wave mechanism 3=19286
- transverse drift oscillations 3=24316
- transverse waves in Vlasov plasma 3=19253
- turbulence, in strong magnetic field 3=21856
- turbulence, for weak nonequil., kinetic theory 3=21844
- two-stream instability, gaseous and solid-state plasmas 3=24312
- 2-stream instability, rel. to ionospheric irregularities 3=23608
- u.h.f. diagnosis by right circularly polarized waves 3=4145
- unstable plasma, kinetic eqn. 3=21833
- Vlasov's eqn., nonlinear effects 3=9817
- wave conversion and scattering on oscillations 3=14614
- wave-probes in collisionless plasma, theory of 3=19281
- wave propag., single, along mag. field 3=24325
- wave propagation in partly ionized gas 3=2009
- wave props. of plasma with doubly humped velocity distrib. 3=2002
- wave radiation by moving charge 3=4173
- waves in liquid with infinite cond., resonance 3=21958
- weakly inhomogeneous plasma, natural oscillations 3=24318
- weakly turbulent plasma, in mag. fld. 3=16968
- weakly turbulent, quasilinear theory 3=21838
- Ag films, surface oscillations 3=10633
- Ar, low-pressure, Ar II spectra excited by electron beams 3=7609
- Au foil, decay by photon emission, after electron bombardment 3=20536
- CdS crystals, space-charge oscillations 3=783
- Cs ion-beam excitation 3=5686
- D, frequency det., gas trapping efficiency 3=2004
- Ge, energies from dielec. const. 3=20436
- Ge, magnetoplasma reson., microwave 3=2893
- He, frequency det., gas trapping efficiency 3=2004
- He, low pressure, He II spectra excited by electron beams 3=7609
- Hg dark plasma, 15 Mc/s 3=4160
- Hg, low-pressure, Hg II, III spectra excited by electron beams 3=7609
- Hg vapour, hot-cathode, l.f. 3=4166
- InSb, electron-hole, injection, p-type, 77°K 3=15591
- InSb, helicon wave propagation, room temp. 3=10827
- InSb, hot magnetoplasma resonance 3=2775
- K, thermal, l.f. oscill. meas. 3=9820
- Ne, glow discharge, pulsed, in spectral line intensities 3=12210

Plasma oscillations—contd

- Ne, low-pressure, Ne II spectra excited by electron beams 3=7609
- Xe, r.f., stationary and running striations 3=4165
- Plastic deformation**
- See also Slip.
- ageing effects, general theory 3=20723
- alkali halide crystals, irradiated, rel. to stress/strain relationships 3=22649
- alkali halide crystals, X-rayed, luminesc. 3=4983
- alloys, light, high-pressure effects 3=18157
- alloys, load-elongation curve, rel. to composition 3=20710
- Armco iron 3=3223
- Armco iron, yield stresses, temp. var. 3=8768
- bar, cylindrical, plastic strain wave propag. 3=5484
- bronze, shear stress under pressure 3=13354
- ceramics, polycryst., microstructure effects 3=23357
- crystal point defects, dislocation loops, generation 3=17727
- crystals, f.c.c. rel. to work hardening 3=23341
- crystals, rel. to ultrasonic velocity changes 3=23325
- cyclic, consolidating medium, stress, tensor 3=16559
- defect conc., effect of prior deform., recovery 3=11154
- and diffusion in solids, enhanced, mechanisms 3=8447
- dislocation-point imperfection interaction, u.s. meas. 3=23326
- elastic threshold, crystals and polycrystals, difference, theory 3=18175
- elasto-plasticity, non-linear boundary value problem 3=7154
- f.c.c. alloys, filings, heavy faulting, by X-ray diff. 3=8418
- f.c.c. metals and alloys, initial yielding 3=11151-2
- fatigue, role of microplastic deform. 3=20699
- ferromagnetic films, rel. to orientation 3=20598
- ferromagnetics, effect on mag. saturation process 3=8669
- ferromagnetics, effect on magnetization curves 3=13247
- frictional stress, rel. to energy radiated from dislocation 3=23304
- graphite, rhombohedral form prod. 3=25627
- high-speed, energy dissipation, with ineffective dislocation mechanism 3=20709
- high temp., crystals and diffusion, review 3=23329
- ice, crystal glide bands, non-basal 3=17763
- indentation of wedge, into semiplane, with creep 3=3228
- interior, zero external force 3=20714
- rel. to internal friction peaks, low-temp. 3=4867
- measurement, use of X-ray microbeam camera 3=9893
- metals, alloys, from calorimeter, liquid-gas film 3=19058
- metals, b.c.c., friction-stress and yield point 3=8765
- metals, cyclic deformation meas. 3=13347
- metals, discontinuous, and deform. rate dependence anomalies 3=23317-18
- metals, effect on diffusion 3=15505
- metals, effect of shock waves, thermodynamic description 3=9547
- metals, f.c.c., annealing rel. to Bordoni peaks 3=23298
- metals, f.c.c., stress-strain law 3=11158
- metals, fatigue, microstructural damage 3=20735
- metals of high purity 3=15531
- metals, localized, rel. to grain boundary sliding 3=17774
- metals, low temp., thermal activation energies 3=25622
- metals, mechanism, theory 3=15987
- metals, polycryst., nature of initial stages 3=20711
- metals, rel. to irradiation, review 3=8466
- metals, rise of diffusion coeff. with plastic strain 3=25296
- metals, yield plateau on stress-strain diagrams 3=5062
- noble metals, recovery 3=23345
- p-n junctions, rel. to resistance 3=10844
- from photoelastic effect 3=13320
- polymers, electron emission, on tearing from base 3=24330
- polytetrafluorethylene, microstructure rel. to mech. props. 3=25800
- quartz, around $\alpha = \beta$ transform. temp. 3=15980
- rock salt, electric charge flow during deformation 3=8767
- rock salt, rel. to optical density spectral distrib. 3=17988
- semiconductors, resistance to indentation rel. to potential 3=23365
- shear stress under pressure 3=13354

Plastic deformation—contd

- steel, due to stress above fatigue limits 3=25643
- steel, initial processes 3=8764
- steel, mild, delayed yield, effect of grain size 3=1227
- steel, mild, rel. to thermal e.m.f. 3=13141
- steel, mild, yield point, rel. to Mn, Si, C, N additions 3=13358
- steel, Ni—Cr—Mo alloy, rel. to martensite formation 3=3323
- steel, residual stresses, in yield plateau region 3=20712
- steel, shear stress under pressure 3=13354
- steel, stress, lattice, residual, X-ray diffr. meas. 3=18180
- steel, stretching, effect on magnetic hysteresis 3=20578
- strain, plane, boundary value soln. 3=7160
- sudden changes in various experimental methods, interdependence 3=13348
- superlattices, based on b.c.c. structure 3=23319
- Teflon, positronium decay, meas. 3=10636
- thermoplastic films, elec. charged, wrinkling 3=23493
- III—V cpds., thin wafers, spontaneous bending 3=3219
- tin bronze alloys, yielding rel. to vacancy conc. 3=23327
- two-stage hypothesis 3=11148
- yield, incompressible perfectly plastic material, calc. 3=11157
- yield strength increase, rel. to dislocation loops 3=23323
- yield stress $K_y\sigma_y$, meas. by grain-size and extrapolation 3=23312
- Ag, multiple glide and orientation changes meas. 3=5068
- Ag, rel. to stacking fault energy 3=15501
- Ag, and strength, tensile, time var., low temp., anomalous 3=20729
- Ag, torsional, and change of elec. cond., law 3=8490
- Ag, vacancy supersaturation 3=13356
- Ag wires, effect on elec. resist. 3=13036
- AgAu, colour change 3=10962
- AgCd, order—disorder transformations 3=3328
- Ag Cl, point defects produced 3=12966
- Ag-10% Sn, f.c.c., filings, heavy deform. faulting, by X-ray diffr. 3=8418
- Ag—Zn alloy stress—strain curves 3=15986
- Al, cyclic structure under large strain ranges 3=20740
- Al, cyclic torsion, dislocation processes 3=25609
- Al, effect on neutron damage, 1.8°K 3=6554
- Al, powder, lattice defects 3=20195
- Al, quenched, rel. to dislocations 3=6515
- Al, ~600°C 3=18183
- Al, and strength, tensile, time var., low temp., anomalous 3=20729
- Al, striations, etching, electron microscope exam., by replica 3=23534
- Al, texture, rel. to cold drawing 3=25783
- Al alloys, age-hardened 3=3222
- Al alloys containing intermetallic cpds. 3=20707
- Al—Cu alloy, effect on clustering 3=18182
- Al—7%Mg alloy, quenched, rel. to dislocations 3=6515
- Al—Mg alloys, during creep 3=3226
- Al—10%Zn, effect on pre-precipitation 3=20896
- Au, internal friction peaks, low temp. 3=3212
- Au, rel. to point defect prodn. 3=22720
- Au wires, effect on elec. resist. 3=13036
- Au wires, rel. to excess vacancy liquidation 3=4862
- Au-20% Cd, f.c.c. filings, heavy deform. faulting, by X-ray diffr. 3=8418
- Be, polycryst., microstrain, annealing effect 3=20190
- Bi, polycryst., under pressure to 20,000 atm. 3=16017
- Cd, initial 3=18181
- Cd, polycryst., ductility 3=15994
- Cd, polycryst., -196°-200°C 3=6800
- Cd, rel. to dislocation multiplication and structure 3=23324
- Cd—Ag alloy, -196°-200°C 3=6800
- Cd—Mg alloy, -196°-200°C 3=6800
- CdTe, dislocations, two types 3=10664
- Co, h.c.p., line breadth meas. 3=11180
- Co, lenticular and very narrow twins 3=8800
- Co and magnetic initial susceptibility and coercive force 3=20576
- Co powders, elastic anisotropy and lattice strain 3=1231
- Co, slip line patterns and hardening curves 3=18187
- Co, stress relaxation 3=18172
- Cu, dislocation array obs. 3=15496

Plastic deformation—contd

- Cu, effect on neutron damage, 1.8°K 3=6554
- Cu, filing, stacking faults, by X-ray diffr. broadening 3=20208
- Cu, formation of point defects 3=22711
- Cu, at 4.2°K, dislocation relax. 3=8757
- Cu polycrystals, surface topography 3=18199
- Cu, rel. to dislocations 3=22788
- Cu, shear stress under pressure 3=13354
- Cu, stored energy meas. 3=15988
- Cu, structural changes, at low temp. 3=20945
- Cu, various rates and temps., recovery of induced thermal force 3=8777
- Cu, yield stress, 4°K, under irradiation 3=10698
- Cu, yield stress, vacancy cluster effects 3=25618
- α Cu—Al single crystals, microstraining 3=20706
- CuAl₃, up to m.p. 3=20718
- Cu₃Au, yield point, for interrupted deform., var. with ordering, strain 3=25623
- Cu₃Au, yield stress rel. to antiphase domain size 3=16001
- Cu—Be crystals, age hardened 3=23315
- Cu—Sb alloy, mech. eqn. of state for yield 3=6870
- Cu-10% Si f.c.c., filings, heavy deform. faulting by X-ray diffr. 3=8418
- Cu—Si—(Mn) alloys, rel. to atomic rearrangements 3=22701
- Cu—Ti alloy, rel. to phase transformations 3=5126
- Cu—Zn alloy, f.c.c., torsional, diffusion rates 3=12999
- Fe, α-phase, X-ray diffr. analysis 3=17662
- Fe, Armco, yielding 3=11176
- Fe, during phase transformations, α—γ, γ—δ, wires 3=23471-2
- Fe, hydro-extruded 3=1215
- Fe, low C content, time-depend. props. 3=15992
- Fe, single crystals, on rolling, effect of orientation 3=13359
- Fe, stress, lattice, residual, X-ray diffr. meas. 3=18180
- Fe, tensile: yield strength, rel. to temp. and annealing 3=13349
- Fe, torsion 700°-1250°C, microstructural changes 3=6857
- Fe whiskers, torsional plasticity, 20°K to room temp. 3=8763
- Fe, yield point rel. to temp. and dislocation—intrusion atom interaction 3=5065
- Fe, yield points, by reapplication of load at low temp. 3=11150
- Fe, yield stress, effects of neutron irradi. 3=11168
- Fe, yield stress for two strain rates 3=15991
- Fe—Al (16%), and twinning 3=18236
- Fe—Cr alloys, single crystal, tensile 3=11156
- Fe—Cr—Ni, rel. to martensitic transform. 3=20883
- Fe—Ni alloy, rel. to martensitic transform. 3=20883
- Fe—3%Si, dislocations 3=20176
- Fe—Si (4%), due to torsion, effect on domain wall velo. 3=11068
- Fe—Si 3.25%, orientation and temp. depend. 3=20713
- GaAs, lattice strain, rel. to isolated defects 3=22861
- GaSb, dislocation-free 3=23322
- Ge, at and below room temp. 3=11155
- Ge, dislocation arrays 3=10669
- Ge, dislocation-free 3=23322
- Ge, 550° to 780°C in N₂ atmosphere 3=18186
- Ge, rel. to dislocation distrib. and density 3=15490
- InSb, dislocation-free 3=23322
- InSb, lattice strain, rel. to isolated defects 3=22861
- InSb, rel. to strain-rate, temp. and O content 3=1223
- InSb, yield drop rel. to heating in O₂ 3=13353
- KBr, effect on thermoluminescence 3=23130
- KCl, effect on X-ray irradi. effects 3=6545
- KCl, rel. to thermal glow luminescence 3=969
- KCl, rel. to thermal glow luminescence 3=23104
- LiF, rel. to dislocations around indentation 3=12970
- LiF, X-ray patterns, unusual effects 3=20948
- Mg—Mn single crystals, work hardening 3=25624
- MgO, dislocation distribution 3=25283
- MgO, motion of dislocations and slip 3=5071
- MgO, prod. of edge-dislocation loops 3=25277
- MgO, rolling contact stresses 3=23321
- Mo, b.c.c., 4.2° to 300°K 3=20174

Plastic deformation — contd

- Mo, crystal dislocations, var. stress 3=22772
 Mo-35 at.% Re, crystal twinning 3=23380
 Na, polymorphic transformation 3=3224
 NaCl, charge effects on dislocations 3=25278
 NaCl, charged dislocation behaviour 3=8435
 NaCl, dislocation processes at surface 3=8785
 NaCl, elec. charge generation 3=23320
 NaCl, rel. to F-centre formation 3=13011
 NaCl, rel. to mosaic block structure 3=20209
 NaCl, single crystal, elec. effects 3=900
 NaCl single crystals, ductility, effect of atmospheric reaction 3=13355
 Nb, effect of strain rate 3=1237
 Nb, inducement of internal friction peaks 3=23303
 Nb-Zr alloys, effect on supercond. 3=21667
 Ni, deformation ageing, theory 3=5072
 Ni, dislocation structure, effect of alloying 3=10658
 Ni, due to torsion, effect on domain wall velo. 3=11068
 Ni, effect of dissolved H 3=11153
 Ni, mechanical twinning 3=25621
 Ni, polygonization and creep, 550°, 700° and 900°C 3=20715
 Ni, stacking faults, elec. cond. change 3=20206
 Ni, yield point, temp. dependence rel. to purity 3=5066
 Ni-(Al, Co), mechanism 3=23332
 Ni-Co alloys, stacking faults, elec. cond. change 3=20206
 Ni-Cu alloys, stacking faults, elec. cond. change 3=20206
 Ni-Cu (30%), due to torsion, effect on domain wall velo. 3=11068
 Ni₃Fe-(3%)Mo, rel. to K-state formation 3=13531
 Ni-Mn alloy, effect on ordering 3=5133
 Pb, microstresses, analysis by X-ray diffr. 3=20704
 Pb, overstressed microregions 3=11142
 PbTe, X-ray diffr. study 3=18203
 Si, dislocation-free 3=23322
 Si, over -196 to 1380°C range 3=5064
 Sn, effect on superconducting transition temp. 3=19125
 Sn, initial 3=18181
 Sn, overstressed microregions 3=11142
 Ta, effect on resistivity 3=13037
 Ta, effect of strain rate 3=1237
 Ta, rel. to internal friction peaks 3=18167
 Ti-Mo alloy, martensitic phases as deformation products 3=23477
 TiNi, low-temp., rel. to phase changes 3=13519
 TiO₂, deformation by slip 3=23328
 TiCl, rel. to luminescence 3=952
 U, $\alpha \rightarrow \beta$ phase transform. 3=1354
 U, cold rolling, X-ray line-shift study 3=8766
 U, single crystals, -196°C, tension 3=15989
 α -U, by rolling above 550°C 3=13370
 UO₂, stoichiometric 3=8773
 V, low-temp., rel. to grain size 3=13351
 W, effect on resistivity 3=13037
 W, particle size and strain determination 3=25785
 W, rel. to twinning 3=18210
 Zn, crystal twinning induction 3=16028
 Zn, dislocation loops, electron micr. study 3=4873
 Zn, initial 3=18181
 Zn, rapid after-effect analysis 3=18197

Plastic flow

- See also Rheology.
 in abrasion of brittle solids 3=11188
 alkali halide crystals, rel. to irradiation 3=22649
 alloys, following yield point, rel. to dislocation-point defect interaction 3=23343
 b.c.c. metals, rel. to temp., mechanisms 3=13352
 complete plane problem 3=93
 crystal bars, explosions at two ends 3=22778
 crystal fracture, review 3=25626
 deformation measurement with radionuclides 3=3225
 duraluminum, dynamic yield on explosive loading 3=1224
 flow curves, pseudoplastic region 3=18198
 iron, Armco, dynamic yield on explosive loading 3=1224
 measurement, apparatus for metals under shear 3=11164
 metals, flow stress, rel. to low-temp. hardness 3=6789
 metals, $t^{1/2}$ law 3=6794
 metals, yield strength, grain size depend., preferred orient. effect 3=25628

Plastic flow—contd

- Petch reln., rel. to disloc. generation 3=17777
 steel, rel. to grain size 3=11149
 steels, low-C, Lüders front propag. meas. 3=1225
 steels, various, dynamic yield on explosive loading 3=1224
 viscosity, steady-state, by extrapolation of creep data 3=25636
 yield condition, allowing for hydrostatic stress 3=25625
 Al-Mg alloys, discontinuous, mechanism 3=25634-5
 Al-Mg, discontinuous, mechanism 3=13369
 Cd, strain-rate depend. of flow stress 3=23338
 Cd, under very small stresses 3=13366
 Co, polycryst., flow stress rel. to dislocations 3=11159
 Cu, flow stress and dislocation density 3=794
 Cu, neutron irradi., strain rate depend. of flow stress 3=20719
 Cu, strain hardening, temp. depend. 3=18201
 Fe, rel. to grain size 3=11149
 Fe-Al alloys, effect of "K-state" structure 3=23467
 LiF, flow stress rel. to F-centres 3=2835
 LiF, flow stress theory rel. to dislocation mobility 3=5070
 Mg, yield strength, stress direction and preferred orient. depend. 3=25628
 MgO, cold worked and annealed 3=25277
 MgO, rel. to neutron-irradiation 3=18185
 Nb, and yielding 3=23314
 Nb, flow stress rel. to temp., mechanisms 3=13352
 Pb, polycrystalline, under simple shear 3=6793
 Ta, transition temperature 3=11163
 α -U, rolled 550°-640°C 3=13370

Plasticity

- See also Viscoelasticity.
 appl. of vectors, tensors and differential geometry 3=15969
 Armco iron, elastic-plastic props. 3=9540
 clays, meas., two new instruments 3=13360
 constitutive derivative in tensor fields 3=14074
 flow laws, non-associated 3=25620
 glass, review 3=6770
 hypo-elasticity theory, examples of rotating shaft and shear 3=16562
 impact, plastic rotating body with plastic half-space 3=16558
 moon, craters, surrounding 3=9171
 partial differential eqns., stress distrib. from crack 3=21275
 photoconductive thermoplastic optical image recorder 3=19030
 plastic waves in elastoplastic medium 3=1749
 reflection of plastic wave from obstacle 3=23968
 tensile instability under complex stress 3=7158
 thermal-mechanical coupling, theory 3=9380
 thermodynamic theory 3=1658
 thermodynamic theory 3=18766
 Al, heat generation, theory and mech. 3=9380
 NaCl whiskers 3=20804
 NaCl-NaBr alloys, ductility 3=15993
 W, cast, effect of recryst. anneal 3=11183
 Zn single crystals, temp. transition from brittleness 3=23316
 Zn, treated with Hg, rel. to irradiation 3=20178

Plastics

- See also Polymers.
 creep and rupture stresses, from eqn. of state 3=8761
 crystallinity, absolute detm. by X-rays 3=18290
 cyanuric acid formaldehyde resins, fluorescence, on addition of aromatic ring compounds 3=15715
 deformation measurement with radionuclides 3=3225
 disperse systems, permeability 3=11737
 flowing melts, temp. probe 3=19052
 Formvar, energy loss of 169keV α -particles 3=7938
 Lucite, positronium mag. quenching in 3=5992
 Lucite, spalling mechanism 3=11180
 luminescence, containing aromatic hydrocarbons 3=7213
 Nylon 8, with methylene bisacrylamide and catalyst, visible latent image prodn. 3=5538
 Nylon 6.6 filaments, crystalline region obs. 3=20863
 nylon threads, tensile strength, simultaneous axial and transverse stresses 3=18206
 Perspex, refr. index, pressure coeff. 3=23036

Plastics—contd

- phosphor NE 102, fluorescent yield for 4-17 keV
X-rays 3=25494
polystyrene-based phosphors, as neutron detectors 3=4411
polythene-P mixture, neutron meas. 3=2284
scintillators, polystyrene-based, for visual obs. of ionizing particles 3=4295
Teflon, e.s.r., liq.-He temp. 3=20657
teflon, friction, on teflon and steel, effect of pressure 3=6808
Teflon, positronium decay 3=4380
Teflon, positronium mag. quenching in 3=5092
Teflon, production of electret state 3=17947

Platinum

- adsorption of CO 3=13571
atom, L-shell fluorescence meas. 3=4711
Bordoni peaks, rel. to deformation and annealing 3=23298
conductivity, electrical, temp. var., 0-900°K and thermometers < 90°K 3=17819
diffusion study by impurity thermionic emission 3=4203
electrical contacts, metal migration 3=9690
electrical double layer, in KNO₃, KNO₃ + NaNO₃, impedance 3=16168
electromigration 3=22829
electron diffrn. exam. of (100), (110) faces with CO absorbed 3=6899
films, elec. resistance, temp. var., rel. to thickness 3=15544
films, reflecting, for vacuum u.v. 3=19005
films, very thin, electrical conductivity, rel. to gas adsorption 3=15549
foils, annealed and irradiated, dislocations 3=8437
foils, dislocations and fission damage 3=25275
foils, loops and dots, rel. to irradiation 3=17701
n.m.r. of Pt¹⁹⁵, 240-299°K meas. 3=13315
optical films, preparation and properties 3=9603
photoelectric emission, X-rays, 0.7-30 keV 3=14638
photoelectric yield data, vacuum u.v., 8 to 24 eV 3=13145
point defects in irradiated metal, review 3=8420
prismatic loops, rel. to irradiation 3=22767
secondary ion emission, A⁺ ion bombardment, 22 keV 3=24373
temp. change at boundary with superfluid He 3=5570
thermal cond., 0-950°C, high temp. reference standard 3=25216
thermionic emission of ions, effect of ambient gas 3=14663
thermocouples with noble metals, instability 3=1861
thin foils, X-ray spectra fine structure "melting" 3=10973
wire, field ionization at surface 3=12067
wires, emissivity meas., 100-1000°C 3=24100
wires, internal friction peaks, at low temps. 3=18166
Pt¹⁹⁵ n.m.r. in Pt metal 3=23255
Pt¹⁹⁵ in powder, n.m. relax. and Knight shift, 20-290°K 3=3201

Platinum compounds

- alloys, dilute, with Co, Fe, Ni, or Mn, magnetic transitions 3=992
alloys, vacancy-impurity binding energies 3=8424
platinocyanides, luminescence, photovoltaic effect, and non-monomolecular processes 3=18030
superconductivity 3=24148
Pt-Al₂O₃ catalyst, surface structure, 300° to 1300°C 3=18367
PtBi, crystal lattice structure 3=18332
PtBi₂, crystal lattice structure 3=18332
Pt-C, phase structr. by electron diffraction 3=1370
Pt cobaltite- and pyrite-type compounds, superconductivity, > 1°K, semiconductivity 3=21663
Pt-Fe, mag. structure rel. to chem. order 3=8696
Pt₃Fe, thermal spikes, size meas. 3=22853
Pt₃Fe, unit cell dimensions 3=25745
Pt-Ir, electrical contacts, metal migration 3=9690
Pt-Rh wires, emissivity meas., 100-1000°C 3=24100
PtSn₂, Pt¹⁹⁵ resonance Knight shift 3=5051
Pt-W alloys, use (over 340°C) for strain gauges 3=6771
Pt-W, superconductivity 3=3962
Pt-W-Cu, tests for high-temperature strain gauges 3=11747

Pleochroism

- aniline hydrobromide, u.v. absorpt. 3=4965

Pleochroism—contd

- aniline hydroiodide, u.v. absorpt. 3=4965
minerals; colour change meas. rel. to orientation 3=922
moscovite, i.r. 3=13164
polarization, dichroism 3=18017
quartz, coloured, synthetic 3=17987
solutions, viscous, photodichroism, reversible 3=16625
viscous solns. of complex organic cpds., reversible orientation 3=23881
CaF₂:Eu²⁺(0.01%) crystal, dichroism, 4.2°K, > 10 kOe 3=17983
CdSb, i.r. meas. 3=923
KCl:LiCl, A-centre, dichroism meas. 3=17794
KCuCl₂ and NH₄CuCl₂ 3=18314
Mg(Ni)F₂, and mag. dipole transitions 3=19993
Zn_{1-x}Cd_xSb, i.r. meas. 3=923

Plutonium

- assay in process wastes, by γ -monitor 3=21021
atom, hyperfine and isotopic structure 3=15290
crystal structure, α and β forms 3=25706
Hall effect in α -phase, 78°-388°K 3=17824
self-damage accumulation 3=22856
spectrum, arc, ground-state multiplet 3=6354
structure rel. to anisotropic thermal expansion 3=10606
thin films prepn. for neutron cross-section meas. 3=11321
X-ray M-absorption spectrum 3=8610
 α -Pu, mechanical props. in compression 3=25602
 β -Pu, crystal structure 3=13448
 δ -Pu, negative exp., effect of alloying 3=22669
Pu²⁴¹, absorption spectrum in La trichloride and La ethylsulphate 3=8601
Pu²³⁹ as fuel for fast reactor 3=22458
Pu²³⁸⁻²⁴¹ as fuels in thermal reactor 3=22459
Pu^{239,241}, nuclear magnetic moment 3=2363
Pu²³⁹, optical h.f.s. and magnetic moment 3=15289

Plutonium compounds

- crystal structure, atomic, < 50°K, absence of phase transform. 3=20833
elastic (Young's) modulus, 4.2-300°K, and mag. transition ~ 55°K 3=20691
nitrides and sulphides, review of phys. chem. props. 3=16473
PuC, 42-60 at.% C, prepn., props. 3=10431
PuD_{1.74}, ferro or ferrimag. props. 3=15783
PuH_{2.74}, ferro or ferrimag. props. 3=15783
PuNi, crystal structure, rel. to similar types 3=18338

Polarimeters

- astronomical, instrumental effects 3=7019
double-beam, photoelectric, 0.2-1.2 μ m 3=9625
ellipsometry, for optical props. of films and surfaces 3=24062
for γ -rays, high energy 3=14937
highly-scatt. solutions, meas. methods 3=16807
interference polarizers, multilayer, for u.v. region 3=19027
magneto-optical effects meas., Kerr and Faraday coeffs. ferromagnetic metals 3=14376
modulator of polarized light 3=14378
phase difference meas., use of phase plates 3=14380
photoelectric, for skylight, 3000-6500 Å 3=19028
polariscope, imperfect circular, theory 3=1836
quarter-wave plate, composite, theory 3=9627
rotation measurement, photo-electric 3=5534
Senarmont, analysis of optical-maser light 3=21570
sheet polarizers, for u.v. 3=5532
solar, spectral, 2-4 Gec/s 3=11491
spectropolarimeter, for Faraday effect meas. 3=19026
spectropolarimetry, instrument problems 3=16806
for visible, u.v., design, construction, performance 3=3894

Polarized light

- See also Double refraction; Optical rotation; Photoelasticity; Polarimeters.
analysis, plane and elliptical, 0.2-1.2 μ m 3=9625
Brewster's angle, apparatus for determination 3=11942
crystals, second harmonic generation of light 3=1839
definition as anisotropy, appl. to luminescence and dichroism 3=18017
durene crystal green emission 3=23114
elliptical, use for metal surfaces study 3=14357

Polarized light—contd

- Faraday rotation in atomic spin system, theory 3=22489
 filament connecting 2 galaxies, polarization 3=7039
 Fraunhofer lines, photoelec. meas. 3=270
 i.r., prod. 3=18990
 i.r., Se mirror polarizer 3=24060
 i.r., use in magneto-optical semiconductor effects 3=14377
 image positron meas. by polarimetry 3=21572
 intensity fluctuations in partly polarized light 3=23994
 interference, for contrast transmission function meas. 3=21522
 magnetic rotation, obs. by optically-dense dispersive media 3=10911
 organic molecules, limiting polarization symmetry rel. to electronic transitions 3=2635
 partial polarization, polychromatic light 3=21573-4
 partially coherent quasi-monochromatic, interference 3=11931
 perylene, luminescence, dispersed in n-heptane, electric field effects, 77°K 3=18043
 phase difference meas., use of phase plates 3=14380
 photoelectric meas. by ADP modulator 3=16808
 photographic demonstration, book 3=257
 from plane wave composition 3=1838
 polarimeter, Waterman's precision 3=1837
 polarimetric method for optical consts. of metals 3=11943
 polyethylene, scattering under dynamic conditions 3=10914
 prod. i.r., reflection from PbS layers, on glass prism 3=16810
 radiation from He due to electron impact 3=4719
 Rayleigh scatt. from thin layer, effect on 3=1835
 refraction and reflection teaching expts. 3=19029
 retardation plate 3=14379
 retardation plate, variable, for visible and u.v. 3=21571
 from ruby laser faces 3=14336
 sea, spatial distrib. of polariz. 3=16200
 self-excitation of metal coated, plane-parallel crystalline layer 3=23031
 Senarmont compensators, inexact, use 3=16809
 sheet polarizers, for u.v. 3=5532
 sky light, percentage and direction 3=1447
 stress analysis, elliptical 3=23813
 sunlight, reflected from sea surface 3=9626
 Vavilov—Cherenkov radn. in biaxial crystals 3=3895
 wavelength dependence and ratio to absorption 3=24061
 Al grating, uncoated, extreme u.v. refl. 3=14375
 He atoms excited by electrons, meas. 3=8209
 from Re films, on Si, thermal emission 3=17980

Polarography

See Chemical analysis, electrochemical.

Polishing

See Surface texture.

Polonium

No entries this year

Polonium compounds

Po—Li neutron source, n- γ coincidences 3=590

Polymerization

- acrylonitrile and vinyl acetate, effect of ionising radiations 3=6925
 average degree, for random scission processes 3=10560
 biological macromols. on templates, kinetics 3=25995
 copolymer, sequence, study by light scattering 3=18443
 copolymers, multicomponent, composition distrib. 3=8956
 graft radiation-induced polymerization 3=8959
 homogeneous ionic, mechanism, diastereosequence distrib. 3=11343
 photopolymer film, visible latent image prodn. 3=5538
 vinyl cpds, correl. frequencies and activation energies of molec. motion 3=23545
 BeCl₂, in conc. aq. soln., Raman data 3=9463
 BeF₂, in conc. aq. soln., Raman data 3=9463

Polymers

See also Plastics.

- adsorption—flocculation reaction with colloid 3=6891
 alkathene 7, electric strength, var. with thickness 3=13125
 amorphous, molecular weight detm. 3=20039
 in amorphous substance, dielectric polarization, theory 3=17928

Polymers—contd

- bonds, C—C, rupture energy differences, explanations 3=20038
 breaking strength, temp.-time depend. 3=20732
 butyl polymethylmethacrylates, diffusion, translation sedimentation, in solvents, meas. 3=9454
 ($-\text{CR}_2^{(1)}-\text{CR}_2^{(2)}-$) type, Kerr constant 3=5437
 Capron fibres, tensile strength, rel. to double refraction 3=23045
 capron, tensile strength of fibres rel. to molec. wt. 3=16003
 cellulose acetate in acetone, u.s. velo. 3=14161
 conc. solutions, entanglement effects from viscosity meas. 3=18809
 configurational props. of random-flight chains in soln. and at interface 3=15404
 cross-linked, infinite network formation, statistical mechanics 3=25159
 cross linked temporarily, viscoelasticity theory 3=11309
 crosslinked, viscoelasticity theory 3=16125
 cross-linking by radiation, monomer effects 3=22618
 crystal structure by detachment replication technique 3=20967
 crystalline and paracrystalline order 3=11275
 crystalline, first-order transition temp. 3=23495
 crystalline, optical and mech. anisotropy 3=917
 crystallization, kinetics, study techniques 3=11234
 crystallization, sequence selection 3=11233
 density-gradient centrifugation, mol. wt. and density distrib. 3=8323
 diastereosequence distrib. 3=11343
 dielectric const. meas., complex, 1-100 c/s, bridge 3=19130
 dielectric constant, complex, meas. apparatus 3=3991
 dielectrics, conductivity, rel. to irradiation 3=20378
 dissociation, linear chain, influence of electronic coupling, erratum 3=8305
 dynamic mech. props. meas. in mid-audio range, 4°-300°K 3=3211
 electrical charges, appearance during deformation 3=20388
 electron emission, on tearing from base 3=24330
 electronic configuration, irreducible representations of spin double line groups 3=2683
 equation of state for linear monolayers 3=11310
 ethyl cellulose in methyl alcohol, u.s. vels. 3=14161
 excluded volume effect in polymer chains 3=12887
 ferromagnetic properties, rel. to ferromag. impurities 3=20566
 films, gas diffusion, linear free-energy relationship 3=2821
 films, growth on metal substrates, by electron bombardment 3=18266
 flexible linear molecules, adsorption theory 3=15405
 fracture, mass-spectrometric obs. 3=18211
 friction, two-term law, on steel 3=13387
 friction, up to few 100 cm/sec, -60 to +300°C 3=16012
 gel formation resulting from cross-linking and scission 3=17625
 helical, absorption and rotation of light 3=10916
 helical, normal molecular vibrations 3=10557
 helical, symmetry, electronic states of double-stranded polynucleotides 3=2682
 high polymetric materials, bibliography 3=13102
 irradiated, mol. wt. distrib. 3=8325
 isomerism, stereo, and transitions 3=20037
 linear chain mols., non-random degradation 3=8324
 linear, solid-state, conformational analysis 3=3351
 liquid, elasticity, shear strength and viscous flow 3=21351
 macromolecular chains, diffusion, translation, sedimentation, in solvents, meas. 3=9454
 methylmethacrylate and styrene, statistical, block and graft co-polymers, structure 3=11791
 methylmethacrylate—Ge interface, surface conductivity 3=20300
 multicomponent copolymers, composition distrib. 3=20040
 non-Gaussian character of real polymer chains 3=10558
 nuclear relaxation times 3=22592
 nylon, pressure-induced transitions, optical study 3=23494
 oriented, structure, X-ray diff. 3=13438

Polymers—contd

- pair potentials in nonpolar media 3=12880
- paraffin crystals, α -dispersion 3=6781
- n-paraffins, cryst., phase transitions 3=16020
- partially crystalline, dynamic degree of crystallinity 3=11308
- permeation through polymer film, anomalous 3=1679
- π -electron excitation, by 20 keV electrons 3=22617
- piezoelectric, 20 natural and synthetic 3=20392
- polar solns., thermodynamic props. 3=11790
- polar solutions, thermodynamic props. 3=14158
- polyacenes, open-shell SCF triplet state energies 3=25128
- polyacenes, triplet-triplet absorption spectrum, polarization 3=23082
- polyacenes, vitreous solid solutions, luminescence, delayed, 77°K 3=20535
- polyacrylonitrile, semiconducting mechanism 3=20341
- polyacrylonitrile, crystal structure 3=11276
- polyacrylonitrile, fibres, mech. props., temp. depend. 3=23358
- polyamides, n.m.r. of water content 3=6768
- polybenzylglutamate, soln., strain birefringence 3=5441
- polybutyl methacrylate-isopropanol, critical opalescence 3=21353
- polycaprolactame, fibres, mech. props., temp. depend. 3=23358
- polychlorotrifluoroethylene crystal growth, oriented on KCl crystal 3=18265
- polychlorotrifluoroethylene, spherulitic cryst., with chain folds 3=3272
- polydeuteroethylene, vibrational spectrum 3=10556
- polydimethyl-diphenyl and polydimethyl siloxanes, cross-linking 3=10563
- polyelectrolyte solns., interaction of neighbouring charged groups, effect on props. 3=21345
- polyelectrolyte solns., volume effect theory 3=21346
- polyelectrolytes, second virial coefft. 3=21347
- polyenes, linear, electron mobility and elec. cond. 3=4926
- polyenes, substituted, solns., fluorescence 3=23891
- polyethylene, α -dispersion and mol. motion 3=6781
- polyethylene, amorphous state 3=3350
- polyethylene, bulk-cryst., internal morphology 3=23368
- polyethylene, cleavage surface, crystallite lamellae 3=13547
- polyethylene containers, liquid scintillation counting 3=14824
- polyethylene crystals, folding of mols. 3=11274
- polyethylene, crystals, i.r. spectra 3=23083
- polyethylene, density, single crystals, by pycnometer 3=20766
- polyethylene, diffusion recombination 3=20379
- polyethylene, dynamic birefringence 3=10915
- polyethylene, effect of irradiation on internal motion 3=13546
- polyethylene, effect of irradiation on elec. cond. 3=10866
- polyethylene, fibres, ion bombardment etching 3=23497
- polyethylene, γ -irrad., thermoluminescence, effect of O_2 3=4995
- polyethylene, γ -ray induced elec. conductivity 3=10874
- polyethylene, irradiated, free radical decay 3=2671
- polyethylene, light scattering under dynamic conditions 3=10914
- polyethylene, linear, orientation determ. 3=11307
- polyethylene, micro-crystals, I-V characteristics 3=8558
- polyethylene, neutron moderation 3=19648
- polyethylene, oxidized, high-pressure, dielectric behaviour 3=22989
- polyethylene, pressure-induced transitions, optical study 3=23494
- polyethylene, recrystallization 3=11232
- polyethylene, small-angle X-ray diff. 3=5153
- polyethylene, specific heat, low-temp., from force consts. 3=8366
- polyethylene, thermoluminescence after γ -irrad. 3=4994
- polyethylene, vibrational spectrum 3=10556
- polyethylene glycol, molecular vibrations and structure 3=6444
- polyethylene terephthalate, diffusion of gases 3=11306
- polyethylene terephthalate, dynamic elastic moduli 3=8754
- polyethyleneterephthalate, fibres, mech. props., temp. depend. 3=23358

Polymers—contd

- polyethylene terephthalate, films, n.m.r. 3=11124
- polyethylene terephthalate, solution of gases 3=11305
- polyethylene terephthalate, structure 3=18372
- polyethylenes, density, shear, crystallinity, temp. depend. 3=13326
- polyethylenes, n irrad., protons polariz. 3=20064
- polyethylenes, Raman spectra 3=8321
- polyethylenes, soln.-grown, mechanical dispersions 3=1400
- polyformaldehyde, γ -irrad., free radicals, e.s.r. 3=12858
- poly- γ -benzyl-L-glutamate in m-cresol, viscosity 3=135
- poly- γ -methyl-L-glutamate, Pauling-Corey α -helix detrm. 3=6838
- poly-i-butylene-benze, solns., optical props., near critical mixing temp. 3=21352
- polyisobutylene, viscoelastic behaviour 3=11167
- polyisobutylene, viscosity 3=7203
- polymethyl acrylate monolayers, viscoelasticity 3=16126
- polymethyl methacrylate, birefringence rel. to stretching 3=17982
- polymethylmethacrylate, dilute soln. props. 3=134
- polymethylmethacrylate in diphenyl solution, shear viscosity rel. to shear stress 3=16619
- polymethylmethacrylate, elastic constants, 50-1000c/s -80 - + 100°C 3=6776
- polymethyl methacrylate, fracture surface energy 3=11179
- polymethyl methacrylate monolayers, viscoelasticity 3=16126
- polymethylmethacrylate, rupture factor 3=3235
- polymethylmethacrylate, with Sn, Mössbauer effect 3=6877
- polymethylmethacrylate, suspensions, spheres, macroscopic, dilute, viscosity, non-Newtonian 3=18788
- polymethyl methacrylate, tensile strength and birefringence 3=18207
- polymethyl methacrylate-butyl chloride, critical opalescence 3=21353
- polyoxymethylene, normal molecular vibrations 3=10557
- polyoxymethylene single crystals, electron microscopy 3=11334
- polypeptides, helical, Cotton effect, origin 3=2681
- polypeptides, helix-coil equilibrium 3=10559
- polypeptides, model for helix-random coil transition 3=8322
- polyphenylene, resistivity 3=4936
- polyphenyls, linear, compressibility 3=15985
- polypropylene, atactic and isotactic, thermodyn. props. rel. to structure 3=10597
- polypropylene, fibres, mech. props., temp. depend. 3=23358
- polypropylene fibres, tensile strength, rel. to double refraction 3=23045
- polypropylene, isotactic, i.r. spectrum and vibrations 3=17624
- polypropylene, n.m.r. second moments 3=3200
- polypropylene, thermal props. rel. to γ -irrad. 3=2728
- polysiloxanes, linear, u.s. relaxation study at 30-270 Mc/s 3=11793
- polystyrene-cyclohexane, solns., critical opalescence 3=21353
- polystyrene-cyclohexane, solns., optical props., near critical mixing temp. 3=21352
- polystyrene, dilute soln. props. in θ -solvents 3=16616
- polystyrene, fracture surface energy 3=11179
- polystyrene-metal mixtures, dielec. props., microwave region 3=22986
- polystyrene, radioluminesc. rel. to mol. wt. 3=23117
- polystyrene, range of 0.2-2.7 MeV tritons 3=10180
- polystyrene, scatt. of elastic waves, nonlinear theory 3=7269
- polystyrene, soln. in cyclohexane, scatt. light, temp. var. 3=9459
- polystyrene soln., light scatt. 3=5530
- polystyrene, in soln., proton mag. reson. 3=11812
- polystyrene solns., second virial coefft. calc. 3=16615
- polystyrenes, diffusion, translation, sedimentation, in solvents, meas. 3=9454
- polytetrafluoroethylene crystal growth, oriented on KCl crystal 3=18265
- polytetrafluoroethylene, irradiated oriented, e.p.r. 3=17608

Polymers—contd

- polytetrafluoroethylene, pressure-induced transitions, optical study 3=23494
 polytetrafluoroethylene, specific heat, low temp., from force const. 3=8366
 polytetrafluoroethylene, microstructure rel. to mech. props. 3=25800
 polythene, electric strength, var. with thickness 3=13125
 polythene, HOH n.m.r. second moment, exptl. verification of calc. 3=10538
 polyvinyl acetate in benzene, u.s. velo. 3=14161
 polyvinyl acetate monolayers, viscoelasticity 3=16126
 polyvinyl acetate suspension, light scatt. 3=11941
 polyvinylamine hydrochloride soln., dielec. props. 3=16635
 polyvinylcarbazol in benzol, glass transition and v.p. curve 3=8920
 polyvinyl chloride, frictional props. 3=11192
 polyvinylchloride, elastic constants, 50-1000c/s -80- + 100°C 3=6776
 polyvinylene, resistivity 3=4936
 polyvinyl pyrrolidone soln., dielec. props. 3=16635
 polyvinyltoluene soln., light scatt. 3=5530
 proton polarization, meas. by neutron irradi. 3=10114
 proton spin decoupling in n.m.r. structure studies 3=25158
 p.v.c., crystallite growth, increase by 1 Mc/s u.s. irradiation 3=13419
 radii of gyration for random flight chains 3=15403
 random scission, average degree of polymerization 3=10560
 reaction kinetics, effects of neighbouring groups 3=8949-51
 reaction kinetics of long chain molecules 3=5157
 relaxation properties, linear dipole chain model 3=21387
 relaxation, thermodynamic const. and activation parameters 3=8780
 relaxation time spectrum, heuristic deriv. 3=4794
 resistivity, effect of drying techniques 3=4936
 rigid, rodlike, in soln., viscosity 3=135
 rubber-like, viscoelastic behaviour 3=11167
 rubber, tearing, molecular mechanism 3=5074
 scattering of light, theory 3=9623
 sedimentation of mixture, rel. to mol. wt. distrib. 3=23554
 semiconducting coordination, Cu derivative 3=22950
 semiconducting, highly conjugated, synthesis and props. 3=10837
 semiconducting, organic, piezoresistance 3=852
 semiconductors, inorganic, Fermi states, calc. 3=20918
 solid, rheology, math. theory 3=18366
 solutions, dilute, hydrodynamic interaction, effect on viscoelasticity 3=18810
 solutions in poor solvents, intrinsic viscosities 3=21350
 solutions, second osmotic virial coeffs. rel. to mol. weight 3=3802
 solutions, specific vol., apparent 3=14154
 solutions, streaming birefringence, anisotropy 3=16618
 solutions, u.s. cavitation, degradation 3=23878
 solutions, u.s. velo. 3=14161
 solutions, viscosities near crit. temp. 3=21349
 solutions, viscosity rel. to temperature 3=18811
 statistics of configuration and free volume of molecule with solvent interaction 3=10562
 statistics of random placement on linear lattice 3=9357
 stochastic processes 3=8320
 stress analysis, dynamic problems, conference 3=13342
 structure, by light scattering 3=16127
 Teflon, γ -ray induced elec. conductivity 3=10874
 thermoluminescence glow peaks after γ -irrad. 3=4994
 triboelectricity 3=6623
 variation with γ -dose of e.s.r. spectra of free radicals 3=25563
 vibrational effects in molecular exciton motion 3=10561
 vinyl, irradiated, mol. wt. changes and gel data 3=17626
 viscoelastic props., mol. weight effects 3=23339
 viscoelasticity, relax. spectra semicrystalline 3=15978
 viscoelasticity of solutions at high press., u.s. meas. 3=14156
 viscosity, high polymers 3=7203
 vitreous, fracture, kinetics under external load, calc. 3=20731

Polymers—contd

- vitreous, crazes, refractive index meas. 3=8579
 X-ray scatt. by oriented polymers 3=16088
 S_2 , liquid, length, by e.s.r. and mag. suscept. 3=14155
 Sn—organic cpd., Mössbauer effect rel. to γ -irrad. 3=17633
Polymorphism
 See also Crystal structure.
 cronstedtite 3=8854
 f.c.c. \rightleftharpoons h.c.p. transformations, rel. to cold working 3=3256
 kaolinite-type, double-layer numerals 3=13447
 methyl ammonium alum, dimorphism 3=1342
 solids, dimorphism, by X-ray analysis 3=11207
 Ba, electronic transition, 5d, 6s levels, high pressure, calc. 3=23372
 Ba, high pressures 3=16834
 Be, 1254°C 3=3297
 CdS 3=18233
 CdSe 3=18233
 Ga, at atmospheric pressure 3=8836
 LiH, < 6 k bar? 3=8794
 Na, low-temp. transform., mech. props. 3=3224
 Pb, at high pressure 3=8883
 SbBr₃ 3=23371
 SbCl₃ 3=23371
 SiO₂, 3CaO 3=3301
 XeF₄, monoclinic phase 3=23452
Polynomials
 Gegenbauer, sum formula 3=1576
 Zernike, modified, applied to Fresnel region fields 3=5528
Porosity
 See Porous materials.
Porous materials
 See also Permeability, mechanical; Surface measurement.
 adsorbed gases, transport, in Knudsen range 3=3370
 anisotropic, fluid permeability 3=7193
 approach kinetics of neighbouring pores 3=25767
 chemical extraction, by diffusion, from capillary channels 3=6906
 coal, pore structure of briquettes, rel. to compacting pressure 3=13550
 diffusion coeff., upper bounds 3=23496
 diffusion of gases, thermal slip flow, separation of two gases 3=9491
 drying, heat and mass transfer 3=1866
 electrokinetic phenomena due to flow of water 3=16596
 ferrites, crystallite dias., var. due to locking of boundaries by pores 3=11242
 fibres, internal volume 3=13551
 flow, air, rarified, from free mol. to viscous flow 3=9483
 flow, Darcy's law, correct form 3=14127-8
 gaseous diffusion in porous media 3=14200
 graphite, thermal expansion accommodation 3=8371
 groundwater flow with free surface, models 3=7189
 ice spheres, "spongy", in atmosphere, radar meas. 3=9041
 kaolinite hydrous micro-quartz clay, moisture expn., surface area 3=6878
 liquid flow, non-Darcy 3=7192
 media impregnated with conducting liquid, elec. conductivity 3=20374
 percolation problems in lattices, Monte Carlo method 3=13997
 polycrystal, surface intergrain grooves 3=10683
 pore size distrib. and permeabilities 3=18369
 porosity meas., by air displacement 3=13548
 shock-wave propagation 3=11856
 vertical column, fluid unsteady drainage 3=7191
 water movement, isothermal vapour transfer 3=11819
 water movement, vapour and liquid 3=20922
 wire meshes, gas flow, resistance, calc. 3=7225
 Cu—Ni films, effect of annealing and loading 3=23510
 NaCl, approach kinetics of neighbouring pores 3=25767
 Ni—Zn ferrites, elec. cond. rel. to porosity 3=4939
 Pt—Al₂O₃, catalyst, 300° to 1300°C 3=18367
 Th₂O, elastic const., temp. depend. 3=23283
 ThO₂ polycrystals, elastic constants 3=13331
 UO₂, sintered in H₂, pore distrib. 3=11311

Positive rays

See Chemical analysis, by mass spectrometry; Ion Beams.

Positive ray sources

See Ion sources.

Positronium

- decay in Teflon 3=4380
- decay in Teflon, effect of lattice transitions 3=10636
- energy levels, by Regge poles and perturbation theory 3=17202
- Lyman α spectral line, det. attempt 3=7839
- magnetic quenching in solids, e^+ helicity 3=5992
- ortho, pick-off quenching in He 3=2252
- oxidation rates in aqueous solns. 3=8955
- spectrum, and i.r. divergence 3=10102
- spectrum, i.r. singularities 3=22114
- $e^+e^-e^+$, simple analytic approx. 3=10484
- Al_2O_3 , formation and dynamics 3=25264

Positrons

See also Electron pairs; and Electrons, which includes both negative and positive electrons when the differences between them are of no special significance.

- annihilation distrib., inhomog. distrib. of positron emitter 3=21198
- annihilation in ionized gas 3=2249
- annihilation radiation, ang. distrib. 3=7835
- annihilation radiation from metals, ang. correl. 3=25263
- annihilation, single-quantum, Z-depend. 3=22111
- annihilation in solid and liq. Hg 3=12954
- annihilation, time distrib., water and organic solutions 3=24707
- depolarization in Möller and Bhabha scatt. 3=14960
- detection in β -ray spectrometer 3=19617
- detection, simultaneous, of 20 e^+ -emitting sources 3=12610
- helicity, from positronium mag. quenching in solids 3=5992
- lifetime, in solids and liquids, var. with pressure 3=10099
- lifetime meas. 3=19149
- lifetimes in aqueous solutions 3=8955
- $\pi^+ \rightarrow \mu^+ \rightarrow e^+$, positrons ang. distrib. 3=2290
- polarization, efficient measuring method 3=10100
- scattering, by electrons, asymptotic radial depend., and positronium spectrum 3=10102
- scattering on electrons, form factors 3=2250
- scattering, by H 3=17542
- scattering by H atoms, s and p-wave, theory 3=2579
- scattering, multiple, rel. to electrons 3=17248
- single-quantum annihilation 3=12445
- spectrometer, scintillation, 4 π 3=7838
- storage rings, design 3=12267
- thermalization, in Ar 3=24706
- Dy¹⁶⁵ decay 3=19823
- Eu¹⁵⁰ decay 3=19822
- Ga, liquid, near m.p., structure, by annihilation 3=21306
- In¹⁰⁷, positron emission 3=19819
- Nd¹⁴¹ decay 3=17441
- from Tm¹⁶⁶ \rightarrow Er¹⁶⁶ 3=8049

Potassium

- atom diffusion on crystal surface 3=25291
- atom, elec. charge, upper limit 3=10091
- atom, scatt. by various atoms and mols. 3=4788
- atomic beam scattering on Hg crossed beam 3=2586
- atoms in A, m.f.p. det., teaching apparatus 3=6367
- atoms, electron scatt., 1-10 eV, total cross-section 3=2582
- atoms, oscillator strengths $KI(4^2S_{1/2} - 4^2P^0_{1/2,3/2})$ doublet 3=17532
- atoms, scatt. by Xe, velocity depend. of cross-section 3=711
- atoms, surface ionization on W 3=9733
- Auger yield in X-ray photoeffect 3=14633
- crystal growth from vapour, meas. 3=3271
- elec. resist., effect of pressure at low temps. 3=828
- films, optical consts, 20° to 60°C 3=25437
- Hall effect, high-field, at 4.2°K 3=840
- ionization, Auger effect 3=12069
- ions K⁺, in N₂ gas, mobility meas. by "time of flight" apparatus 3=7437
- ions, K⁴², range in Al 3=12608
- molecular beams, reaction with HBr 3=6914

Potassium—contd

- molecular beams, wide-angle scattering 3=6439
 - molten, self-diffusion 3=16610-11
 - moving edge dislocations 3=10654
 - optical constants, Drude theory analysis 3=17975
 - optical constants of solid and liq., meas. 3=17974
 - orthogonalized plane wave form factors 3=25229
 - photoelectric effect, internal, rel. to frequ. 3=17976
 - photoelectricity, inner, var. with wavelength 3=22897
 - plasma, ion waves, l.f. 3=16964
 - plasma, thermal, l.f. oscillations 3=9820
 - resistivity, elec., effect of capillary constraints 3=7410
 - specific heat calc., Toya's method 3=10599
 - thermoelectric power of boundary atoms 3=17968
 - thin films, structure, elec. and optical props. 3=18385-89
 - thin films, structure, elec. and optical props. 3=18391-2
 - vacuum deposition 3=11844
 - vapour pressure, correlation, 3=14423
 - whisker growth from vapour by field emission 3=3276
 - K, ion analysis following Ar⁴¹ β^- decay 3=19954
 - NH₃ soln., e.s.r., effect of adding KI 3=11811
- Potassium compounds**
- alloys, superconductivity 3=16873
 - azide, cryst., i.r. spectrum 3=18004
 - crystalline, organic, Raman spectra compared with solutions 3=6650
 - halides, crystal growth, by floating zones 3=6825
 - halides, diffusion of Ar, prod. by n irradi. 3=15508
 - iodide-tri-iodide solion electrochemical diode 3=16887
 - potash alum, etch pits rel. to defects 3=23386
 - thiocyanate complexes, vibn. spectrum, structure 3=3012
 - Tutton salts, K Zn(SO₄)₆·6H₂O and K₂Mg(SO₄)₆·6H₂O, proton mag. resonance ²³3=8740
 - K dihydrogen phosphate, relaxation in extreme i.r. 3=17942
 - K formate, acetate and propionate, u.s. props. 3=14162
 - K halides, doped with O, S, Se, Te, optical props. 3=2999
 - K halides, intrinsic optical props. 3=25433
 - K halides, recombination luminescence 3=3034
 - K halides, sp. ht. rel. to spectroscopic behaviour 3=765
 - K halides, X-ray K-absorpt. of K 3=6662
 - KAl(SO₄)₂·12H₂O, rel. to movement and faceting 3=16034
 - KB₂O₆·4H₂O 3=13477
 - β -K₃Bi crystal structure 3=20841
 - (K_{0.5}Bi_{0.5})TiO₃, lattice parameters 3=20851
 - (K_{0.5}Bi_{0.5})TiO₃, phase transformations, 270° and 410°C 3=20851
 - KBr, α -centres, fluorescence 3=17796
 - KBr, α and β absorpt. bands in vacuum u.v. 3=8590
 - KBr, coloration near fundamental edge 3=15517
 - KBr, colour centres due to electron pulses 3=8460
 - KBr, dielectric const., 8 mm, by shorted-line waveguide 3=22973
 - KBr, diel. relaxation in coloured crystals 3=6613
 - KBr, diffusion of TI⁺ ions meas. 3=6536
 - KBr, electrical conductivity, rel. to anion impurities 3=17944
 - KBr, equation of state, Grüneisen approx., temp. var., calc. 3=20115
 - KBr, F₂⁺-centres 3=20240
 - KBr, F-centres, excited states 3=20244
 - KBr, F⁺-type absorption bands 3=22840
 - K Br, F'-type absorption bands rel. to complex colour centres 3=815
 - KBr, fused, refractive index rel. to temperature 3=11706
 - KBr, hydroxyl and U-centres, additively coloured 3=13013
 - KBr-KI mixed crystals, F-bands 3=4889
 - KBr, lattice dynamics, dispersion curves 3=20074
 - KBr, Li A-centres, ENDOR study 3=25299
 - KBr, phase transformations, high-pressure, from compressibility, shock 3=18179
 - KBr, secondary electron emission region, thickness and efficiency 3=19323
 - KBr, secondary emission, by K ions 3=16978
 - KBr, sp. ht. spectroscopic meas. 3=12926
 - KBr, spin-lattice relax., temp. depend. 3=11118
 - KBr, surfaces of melt grown ingots 3=23502
 - KBr thermal resistance, rise nr. Debye temp. 3=17670
 - KBr, thermoluminesc. after plastic deform. 3=23130

Potassium compounds—contd

- KBr : Tl, emission spectrum 3=4984
 KBr, U_2 -centre, e.s.r. and photochem. 3=10696
 KBr, X-ray line broadening, and strain 3=8934
 KCN, rate of hydrolysis, ultrasonic meas. 3=8952
 K_2CO_3 , thermodyn. props. at high temps. 3=22663
 $K_2C_2O_4 \cdot H_2O$ 3=8728
 KCl, additively coloured, internal friction 3=23291
 KCl, additively coloured, M-centre formation 3=4892
 KCl, additively coloured, photoemission of electrons 3=24336
 KCl, α and β absorpt. bands in vacuum u.v. 3=8590
 KCl, α -centres, fluorescence 3=17796
 KCl, aq. soln., freezing 3=3927
 KCl, β -irrad., elec. charge of dust from 3=902
 KCl, bleaching at 77°K by F-band irrad. 3=6543
 KCl, Bordoni peaks 3=23294
 KCl, Born repulsive energy 3=2690
 KCl, coloration near fundamental edge 3=15517
 KCl, colour centre prodn., rel. to γ -irrad 3=22842
 KCl, colour centres due to electron pulses 3=8460
 KCl, colour centres, e.s.r. 3=23234
 KCl, colour centres, F, Z_2 3=23235
 KCl, colour centres, X-ray prod. 3=25297
 KCl, crystal etching and polishing 3=18242
 KCl, cyclotron resonance, rel. to mag. fld 3=20149
 KCl, decomposition by electron irrad. 3=17809
 KCl, dielectric const., 8 mm, by shorted-line waveguide 3=22973
 KCl, diffraction of 8-45 Mc/s ultrasound 3=12918
 KCl, diffusion of Pb ions in crystal 3=15510
 KCl, dislocation loops, rel. to electron bombardment 3=17808
 KCl, dislocation observation by electron microscope and electron diffraction 3=802
 KCl, divalent-doped, Z_2 centres, growth and bleaching 3=22846
 KCl, doped with KNO_3 , X-irrad., e.s.r. 3=25573
 KCl, e.p.r., Sr, F centres 3=23235
 KCl, elastic constants, rel. to temperature 3=18163
 KCl, electrical conductivity, rel. to anion impurities 3=17944
 KCl, electron conduction and breakdown, rel. to γ -irradiation 3=23020
 KCl, electron and γ -irrad., hardening and F-band coloration 3=23359
 KCl, equation of state, Grüneisen approx., temp. var., calc. 3=20115
 KCl, exoelectron emission spectrum 3=14618
 KCl, F-aggregate centres, thermal prod. 3=4891
 KCl, F-centres, aggregation, e.s.r. meas. 3=25302
 KCl, F-centres, e.s.r. with h.f. modulation 3=15932
 KCl, F-centres, excited states 3=20244
 KCl, F-centres, formation, and optical bleaching, rel. to impurity effects 3=22841
 KCl, F-centres and strain due to X-rays 3=6545
 KCl, F colour-centres, thermoluminescence, bleaching, effect of impurities 3=20246
 KCl, F and F' centres, electronic-vibrational state interaction 3=22839
 KCl, $F \rightleftharpoons F'$ reaction and F' lifetime 3=2840
 KCl, F and M-centre equilibrium 3=8461
 KCl, F, R and M-centres, prep., props., and models 3=2836
 KCl, F'-type absorption bands 3=22840
 KCl, F'-type absorption bands rel. to complex colour centres 3=815
 KCl, fused, refractive index rel. to temperature 3=11796
 KCl, fused, thermoelectric power 3=9477
 KCl, growth rate and nucleation from soln. 3=5084
 KCl, Grüneisen const., Born's theory 3=25203
 KCl, Grüneisen γ , temp. depend. calc. 3=10607
 KCl, hardening, by colour centres 3=22833
 KCl, hardening by quenching and irrad. of single crystals 3=16008
 KCl, heavily γ -irrad., F- and M- band absorption 3=813
 KCl, imperfections, direct obs. with electron micr. 3=2782
 KCl, imperfections, electron microscope obs. 3=17711
 KCl, imperfections, rel. to electron and X-irrad. 3=22708

Potassium compounds—contd

- KCl with impurity valence changes, e.s.r. 3=1180
 KCl, K-absorpt. spectrum of Cl 3=6660
 KCl, kinetics of adsorbed layers on W 3=11323
 KCl; M, R, N, temporary bleaching 3=818
 KCl, motion of F-centres 3=6544
 KCl, N- centres 3=820
 KCl, optical excitation of I atoms, luminesc. 3=15709
 KCl, phase transformations, high-press., from compressibility, shock 3=18179
 KCl, plastically deformed, thermal glow luminescence 3=263
 KCl, photoelectric emission, by X-rays, 0.28-9 keV, on films, effective depth 3=21864
 KCl, point defect aggregation 3=22731
 KCl, point defects from electron irrad. 3=12967
 KCl, quench-hardening 3=11172
 KCl, scattering of light, rel. to defects in single crystals 3=920
 KCl, secondary electron emission region, thickness and efficiency 3=19323
 KCl, spectrum and ionic cond., OH^- effects 3=18005
 KCl, sputtering, low-energy, K atom ang. distrib. 3=4215
 KCl, use as standard for thermal cond. meas. 3=5548
 KCl, surface defects, high temp. processes 3=20214
 KCl, surface energy of {100} planes 3=25178
 KCl, surface features, Czochralski growth method 3=11218
 KCl, surface ioniz. on W and Ta 3=5632
 KCl, thermal glow luminescence, rel. to plastic deformation 3=23104
 KCl, thermal resistance, fall nr. Debye temp. 3=17670
 KCl thermoluminescence, rel. to surf. area and gas press. 3=18052
 KCl, transient luminescence from plastic deform. 3=4983
 KCl, U_2 -centre, e.s.r. and photochem. 3=10696
 KCl, X-ray K-absorpt. spectra of K and Cl 3=20497
 KCl, X-ray photoeffect, Auger fields for Cl and K 3=14633
 KCl, X-rayed, u.v. absorption spectrum 3=3013
 KCl:Ag, Pb, fluorescence decay curves 3=23103
 KCl : Ag, X-irrad., trapped holes and electrons 3=5044
 KCl:Co²⁺ and Ni²⁺, optical behaviour 3=10923
 KCl : H, F-centres, excited states 3=20244
 KCl-KBr, mixed crystals, diffusion formation 3=13004
 KCl-KBr mixtures, colour centres 3=10693
 KCl, KBr, U-centres, i.r. absorpt. 3=13014
 KCl, Li A-centres, ENDOR study 3=25299
 KCl:LiCl, A-centre, dichroism meas. 3=17794
 KCl-NaCl colloids, optical absorption 3=930
 KCl-NaCl melts, i-E oscillograms 3=16173
 KCl-NaCl mix crystals, dislocations, on decomposition, obs. by etching 3=12985
 KCl-RbCl mixtures, colour centres 3=10693
 KCl: Sr, Z-centres absorption, e.s.r. 3=25304
 KCl:Tl, Condon approx. to centre of luminescence 3=3044
 KCl : Tl, emission spectrum 3=4984
 KCl:Tl and KCl:Ag, luminescence rel. to impurities 3=18022
 KCl:Tl, pressure-effect model for luminescent centre 3=10992
 KCl : Tl, Sr, F-centres thermal stability 3=4890
 KClO₃, Cl³⁵ and K³⁹ or ⁴¹, double resonance 3=23265
 KClO₃, X-ray K-absorpt. spectra of Cl 3=23090
 KClO₃, X-ray K-absorpt. spectra of K and Cl 3=20497
 KClO₄, X-ray K-absorpt. spectra of Cl 3=20498
 KClO₄, X-ray K-absorpt. spectra of K and Cl 3=20497
 K₃Co(CN)₆, paramag. relax. of Fe, freqn. depend. 3=25572
 KCoF₃, crystal-field spectra of d³, d⁷ ions 3=25453
 KCoF₃, crystal struct. 3=1332
 K₂(Co,Fe) (CN)₆, spin-lattice relaxation 3=18140
 K₂CrO₄, neutron irrad. annealing 3=22871
 K₂CrO₄, Cr e.s.r. and optical spectra 3=3166
 K₂CrO₄, phase transformations, up to 100 kb 3=25655
 KCrO₄ solution, magnetic susceptibility 3=146
 K₂CrO₄, thermal neutron capture, compression annealing 3=25311
 K₂Cr₂O₇, electronic absorpt. spectrum 3=15871
 K₂Cr₂O₇, phase transformations, up to 100 kb 3=25655

Potassium compounds—contd

- KCuCl₂, crystal structure 3=18314
 K₂CuCl₄·2H₂O, e.s.r., amalgamation 3=20640
 K₂CuCl₄·2H₂O, proton mag. res. rel. to electron distrib. 3=1208
 KD₂PO₄, dielectric and optical props. 3=17943
 KD₂PO₄, paraelec. response meas. 3=10871
 KF, fused, refractive index rel. to temperature 3=11796
 KF, 2Al(C₂H₅)₃, crystal structure 3=11272
 K₂Fe(CN)₆, crystal, absorption spectra, 20-28 kK, rel. to temp. 3=3011
 K₃Fe(CN)₆, ferric ion exchange interaction 3=1054
 KFeF₃, crystal struct. 3=1332
 KFeS₂, Curie point meas. 3=12894
 KH₂F₃, crystal structure and geometry of H₂F₃⁺ ions 3=8847
 KH₂PO₄, dielec. const. at 9.2 Gc/s 3=8553
 KH₂PO₄, far i.r. dielec. props. 3=15687
 KH₂PO₄, light harmonic generation, by laser, mode effects 3=23995
 KH₂PO₄, light modulation at microwave freqn. 3=5535
 KH₂PO₄, low freq. H vibs. 3=20384
 KH₂PO₄, optical harmonic generation 3=20453
 KH₂PO₄, optical harmonic generation, continuous, using gas laser 3=21507
 KH₂PO₄, second harmonic generation of light 3=1839
 KHgBr₃, crystal structure 3=18315
 K₂HgI₄, K₂HgI₄·H₂O structure, from powder, spectra, diffuse reflectance, u.v. 3=23557
 KI, α-centres, fluorescence 3=17796
 KI crystal growth 3=20795
 KI, decomposition by u.s. waves 3=16162
 KI, dislocation loops, rel. to electron bombardment 3=17808
 KI, motion of F-centres 3=6544
 KI, spin-lattice relax., temp. depend. 3=11118
 KI, impurity-substituted, [100] field gradients, n.m.r. meas. 3=18152
 KI:In, intracentre luminescence 3=945
 KI, I¹²⁷ quadrupolar spin-lattice relaxation time 3=18156
 KI, X-rays, "white" Cu, effects, loops and screws 3=13024
 KCl·H₂O, refinement of crystal structure 3=13476
 KI.Hg(CN)₂, crystal structure 3=8855
 KIO₃, crystallization, in presence of 10-14% HIO₃ 3=23405
 KIO₃, spectrochemical analysis, powder, by spectrum, diffuse reflectance, u.v. 3=23557
 KI:Ti, emission spectrum 3=4984
 KI:Ti, i.r. absorption, γ-irrad. effects 3=25449
 KI:Ti, luminescence, decay time meas. 3=10005
 KI:Ti, luminescence due to X-rays 3=4982
 K₂IrCl₆, optical spectrum 3=4973
 KMgF₃:Ni²⁺, optical spectra 3=12892
 KMg(Ni)F₃, mag. dipole transitions 3=19993
 K (Mn, Co, Ni) F₃, superexchange interaction 3=25553
 KMnF₃, antiferromag. resonance 3=1198
 KMnF₃, antiferromag. resonance and Mn⁵⁵ n.m.r. 3=15966
 KMnF₃, crystal struct. 3=1332
 KMnF₃, luminescence, temp. var. large 3=23102
 KMnF₃, Mn⁵⁵ antiferromag. -nuclear double resonance 3=25582
 KMnF₃, specific heat, 78-300°K, and antiferromagnetic and crystal structure transitions 3=8365
 KMnF₃, spin-wave instability 3=20637
 KMnO₄, directed crystallization, rel. to ultrasonics 3=16044
 KMnO₄, phase transformations, up to 100 kb 3=25655
 KMnO₄ solution, magnetic susceptibility 3=146
 K-NH₃ soln., decomposition, e.p.r. study 3=3381
 KNO₃, fused, transport numbers 3=16172
 KNO₃, fused, transport numbers 3=16172
 KNO₃, dielectric and piezoelectric properties 3=16033
 K₂NbO₅F, structure and thermal props. 3=3306
 K₃NbO₅ with small amount of K₂CrO₅, Cr e.s.r. and optical spectra 3=3166
 KNiF₃, antiferromagnetic resonance in far i.r. 3=15930
 KNiF₃, covalency, LCAO-MO model 3=12893
 KNiF₃, covalent orbitals, n.m.r. study 3=12891
 KNiF₃, crystal struct. 3=1332

Potassium compounds—contd

- KNiF₃, optical and mag. props, molec. orbital analysis 3=333
 KNiF₃, optical spectra, covalency effects 3=12892
 K₂NiF₄, mag. structure meas. 3=3138
 K₂NiF₄ type, mag. props. 3=11024
 KNO₃, ferroelec. props. at room temp. 3=2958
 KNO₃, fused, refractive index rel. to temperature 3=11796
 KNO₃, fused, splitting of Raman frequencies 3=4761
 KNO₃, heat of fusion, entropy 3=21617
 KNO₃, molten, heat of solution of AgCl 3=14153
 KNO₃, NO₂ and NO₂⁻ e.s.r. 3=11116
 KNO₃, polymorph transition rates 3=20772
 KO, crystal structure, atomic, by X-ray powder diffr. 3=16071
 K₂O-Nb₂O₅, growth peculiarities 3=16033
 K₂O-Ta₂O₅, growth peculiarities 3=16033
 KPF₆, specific heat and phase transitions 3=12927
 K₂(SO₃)₂, aq. soln., electron spin exchange 3=16639
 K₂(SO₃)₂NO, h.f.s. and coupling consts., from e.s.r. 3=14183
 K₂SO₄, fused, refractive index rel. to temperature 3=11796
 K-Sb films, elec. cond. and photoemission 3=8495
 K₃Sb, film, photoelectric emission, effect of n irradiation 3=14632
 KSCN, elec. conductivity of solid 3=22983
 KSCN, fused, refractive index rel. to temperature 3=11796
 KTaO₃, dielectric props. near Curie point 3=17936
 KTaO₃, far i.r. dielectric dispersion 3=4947
 K₂TiO₃, Ti X-ray spectra, emission, bond type and Kβ, line changes 3=23092
 K₃UO₂F₆, spectrum, i.r., and U-O bond force const. 3=22575
 K₂Zn(SO₄)₂·6H₂O, Cr³⁺ e.s.r. 3=18130
- Powders**
 See also Granular structure; Particle size; Sintering; Surface measurement.
 alkaline earth oxides, sintered powders, thermal cond. 3=25209
 antiferromagnetic resonance 3=23217
 compressibility, liquid filled, longitudinal 3=11737
 diamond, particle size analysis, comparison of methods 3=23825
 electron microscopic study 3=20961
 fluidization of particles packed in layer condition 3=100
 graphite, particle size rel. to diamag. props. 3=1120
 heat transfer, in outgassed samples 3=3907
 insulators, made of pressed powders, thermal cond. 3=25217
 n.m.r., line broadening by field inhomogeneities 3=5048
 optical constants, theory 3=10901
 organic, photo- and radioluminescence, duration 3=15716
 paramagnetic, analysis by mag. separator 3=9903
 particle size, distrib. 1-40μ, using photosedimentograph 3=16570
 phthallic acid, reflection spectra, rel. to absorbed layer 3=23062
 quartz, ground respirable size, distributed layer 3=16128
 quartz, ground and shattered, X-ray diffrn. 3=3352
 shock excitation, thermal, spectroscopy 3=24018
 thermal cond. meas. appar. at high temps. 3=21584
 X-ray absorption, meas. appar. 3=12281
 X-ray crystallography, camera, Debye-Scherrer 3=6943
 X-ray scatt., diffuse, meas. 3=11251
 Al, heat of wetting, by hydrocarbons, in solution 3=16131
 Ba ferrite powders, effect of particle size on coercive force 3=15879
 Ba ferrite, single-domain magnetic props. 3=15880
 Co, deformed, elastic anisotropy and lattice strain 3=1231
 Co, n.m.r. of nuclei in Bloch walls 3=3193
 Cr₂O₃, antiferromagnetic properties 3=8697
 Cu, C-reduced, density, flow rate 3=13552
 Cu-Ni, interdiffusion, X-ray diffr. study 3=2823
 Fe, carbonyl, mag. permeab., hysteresis loss factors 3=11089
 Fe, n.m.r., effect of external mag. field 3=1203
 Fe, sintering rel. to grain boundary sliding 3=11293
 α-Fe₂O₃, antiferromagnetic properties 3=8697
 γ-Fe₂O₃, micropowders, ferrimag. resonance 3=1175

Powders — contd

- Ge, n-type, adsorption of water 3=6890
 KCl, elec. charge, from β -irrad. crystals 3=902
 KIO₃, spectrochemical analysis, by spectrum, diffuse reflectance, u.v. 3=23557
 K₂HgI₄, K₂HgI₃·H₂O, spectra, diffuse reflectance, u.v. and mol. configuration 3=23557
 Nd—Mg double nitrate, reflection spectrum 3=23063
 NiO, antiferromagnetic properties 3=8697
 Sn, compacted, density rel. to pressure 3=6875
 Sr ferrite, single-domain magnetic props. 3=15880
 UC, Xe diffusion 3=2834
 ZnS, electroluminescence, microscopic exam. 3=11012

Praseodymium

- atom, third spectrum, energy level analysis 3=15291
 spectrum, visible, rel. to 4f shell transitions 3=13182
 Pr³⁺, absorption and fluorescence spectra in LaBr₃ 3=3014
 Pr³⁺, approx. excited eigenfunctions 3=2572
 Pr³⁺ ion, configuration interaction 3=10960
 Pr³⁺, i.r. absorption spectra in soln. 3=9462
 Pr³⁺, spectra in ethylsulphate crystals 3=10959

Praseodymium compounds

- ferrite, ortho, effect of substituting Al³⁺ for Fe³⁺, from mag. meas. 3=8683
 oxides, dipole relaxation, rel. to crystal structure 3=8552
 PrAl₂, mag. moment and Curie pt. 3=991
 PrBr₃, crystal elec. field, effects on Pr³⁺ 3=10569
 Pr₂C₃, neutron diffract. and paramag. scatt. analyses 3=1328
 PrCl₃, crystal elec. field, effects on Pr³⁺ 3=10569
 PrCl₃, crystal-field shielding 3=17629
 PrCl₃, electronic Raman effect 3=15694
 PrCl₃, spectrum, ion-pair absorption lines, 22220–28100 cm⁻¹ 3=23075
 PrF₂, growth of highly-perfect single crystals for masers 3=23397
 PrH₂ (x = 2.02–2.71), mag. props., variation with temp 3=15744
 PrI₃, molten, elec. cond. of Pr 3=21404
 Pr(NO₃)₃·6H₂O, crystal structure, atomic 3=18326

Precipitation

- See also Atmosphere, precipitation.
 alloy EI-437A, anodic dissociation 3=8913
 alloys, hardening, effect of u.s. waves 3=16109
 alloys, second phase plates growth at grain boundaries rel. to migration 3=13534-5
 β -brass, meta-stable, fatigue-induced 3=1359
 coprecipitation in mixed crystal formation 3=1275
 crystal nuclei in small drops 3=5081-2
 crystal vacancies, rel. to dislocation origin 3=22743
 Cunio I, cold-rolled and heat-treated, micro-structure 3=20895
 Cunife I, cold-rolled and heat-treated, micro-structure 3=20895
 impurities in fluids, electric cleaning 3=4027
 isotropic solids, coherent nucleation and fluctuations 3=1251
 kinetics study using dilatometer 3=21277
 quasi-periodic, in interdiffusion of 2 subs. 3=8957
 review 3=20893
 solid solution, defect clusters, rel. to elastic interaction 3=22697
 solid solns., effect of quenching defects 3=8909
 solid solns., supersat., ideal pre-pptn. 3=8910
 spherical particle growing by diffusion or heat flow 3=11297
 steel 18 Cr/1% Ni/1 Nb austenitic Ni and Cr precip. 3=18358
 steels, austenitic, NbC precip., rel. to heat treatment 3=18359
 steels, austenitic, NbC precip. on stacking faults 3=18357
 Vicalloy, cold-rolled and heat-treated, micro-structure 3=20895
 in Al—Ag(25%), electron microscope study 3=16110
 Al—20% Ag, heterogeneous 3=18356
 Al—Ag alloys, quenched from 550°C and aged 3=25803
 Al—Cu alloy, clustering, deform. effect 3=18182
 Al—Cu alloy, θ' , interact. with dislocations 3=12977
 Al—Cu alloys, recrystallization, effect of dispersed second phase 3=25757

Precipitation — contd

- Al—(1.6 wt.%)Cu interaction with dislocations 3=20894
 Al—Cu, pre-pptn. phenomena 3=8876
 Al—Si alloy, effect on mech. props. 3=13538
 Al—Si alloys containing Mg 3=18355
 Al—Zn alloy, precipitation, effect of Mg 3=20167
 Al—Zn alloys, ageing, n.m.r. study 3=11295
 Al—10% Zn, pre-pptn. rate, plastic deform. effect 3=20896
 Al—30% Zn, spherical pre-pptn. zones 3=8911
 Al—Zn—Mn alloy, ageing sequence, 100°C 3=13542
 Au—Ni alloy, ferromag. precipitate obs. 3=5138
 C in Fe—C alloys, kinetics study 3=6867
 C in Fe—C, rel. to radiation-produced defects 3=22866
 C, out of extra-soft steels 3=16111
 Ca, coprecipitation with U and Th oxalates 3=1275
 CoCl₂ in NaCl, Mössbauer effect study 3=22630
 Co—Ni—Nb alloys, discontinuous 3=20724
 Cr—N alloys, dilute 3=6865
 Cr spinelides, Cr₂O₃, precip. rel. to calcination 3=16081
 Cr—Ni system, equil. diagram 3=11289
 Cu—Co alloy, coherency strains around precipitates 3=1222
 Cu—3%Co alloy, hardening 3=20898
 Cu—(2 wt.%)Co interaction with dislocations 3=20894
 Cu—Fe rel. to Mössbauer effect 3=22698
 Fe, rel. to creep, 550°–700°C 3=18189
 Fe—C alloys, α -tempered, carbide pptn. 3=13539
 Fe—C alloys, quench-aged, structure 3=20903
 Fe—0.03% C, rel. to Nb addition 3=20899
 Fe—N alloys, quench-aged, structure 3=20903
 Fe—3% Si, grain growth obs. 3=18360
 Ge, rel. to defect study 3=22703
 Ge, rel. to Hall effect carrier concentration discrepancy 3=17861
 in Mg oxide, impurity ppts. 3=20169
 Mg₂Si in Al—(7%)Mg—(0.015%)Si 3=10666
 from NaCl—CaCl₂ solid soln. 3=20840
 Ni in Si 3=6537
 Ni—Al bronze, β — α reaction, non-equil. segregation 3=18352
 Ni—10.1 at.% Ti, rel. to ferromagnetic Curie temp. 3=25755
 Pb—Sn and Pb—Cd, effects on superconductivity 3=24145
 Sb in Si 3=18361
 Ti—Al—Co alloys, effects on mech. props. 3=18204
 U from UO₂ crystals 3=13591
 U—Mo alloy, γ -quenched, annealing 3=5135
 W—Re alloy, σ -phase particle obs. 3=18340
 ZnO, aerosols, by l.f. spiral acoustic field 3=18462
 ZnTe, Te pptn. 3=16049
 Zr—H system 3=20905
 ZrH₂ in Mg—1/2 wt. % Zr alloy, rel. to corrosion attack and creep 3=16116
 ZrH₄ in Zr, electron micr. study 3=11294
 ZrO₂, on grown-in dislocations in MgO 3=10673

Pressure

- See also Atmospheric pressure and density; High-pressure phenomena and effects; Radiation pressure; Vapour pressure.
 gas film, "wedge pressure" 3=1723
 liquids, internal, rel. to u.s. velocity 3=21358
 shells, instability, local, bulging 3=5394
 transonic pressure fluctuations 3=23923
 vars., reson., and 10–25kV X-rays, pot. prod. on Ar 3=7449
 He⁴, liquid, near λ point, ($\partial \rho / \partial T$) 3=12018

Pressure measurement

- See also Manometers; Vacuum gauges; Vapour pressure measurement.
 dynamic pressure differential of 0.1 μ Hg, gauge 3=1736
 from elec. resistance values, conversion scales 3=23830
 errors in vicinity of gas discharge 3=12092
 fluctuations meas., probe—microphone system 3=1782
 in glass systems, boro-silicate, by strain gauge, external, 0–2 atm. 3=21290
 high, by use of volume discontinuities, corrections 3=9404
 low-pressure indicator, effect of connecting passage 3=16571
 low transient press., by surface tension gauges 3=7169
 McLeod gauge, 10⁻⁴–1250 torr 3=18775

Pressure measurement—contd

- Mercury reservoir for barometer demonstration. 3=151
 piezoresistive effect in resin-bonded C, use of 3=21288
 piston gauge, corrections, temp., press., gravity 3=21289
 piston gauge, to 3000 atm 3=1652
 in tetrahedral anvil device, pres. distrib., hysteresis meas. 3=7168
 use of variable retardation plate 3=21571
 $<10^{-10}$ torr, by Bayard-Alpert and magnetron gauges 3=23951

Prisms, optical

- dispersion through prisms and prism combinations 3=242
 reflecting, for optical bench screen 3=243
 reflection, total, for autocollimation alignment 3=21527
 roof, without ray pencil splitting 3=21526
 silica, fused, inhomogeneity compensation 3=21528
 thin prisms, testing of deflection 3=235

Probability

- See also Errors; Random processes; Statistical analysis.
 characteristic function rel. to Fokker-Planck methods 3=16491
 extrapolation, reliability, over long periods 3=5327
 extreme probability paper, plotting rule 3=11673
 linear stochastic operators 3=14037
 Markov processes and the H-theorem 3=11709
 Maxwell velo. distrib., derivation 3=16540
 meteorological extremes, applic. of envelopes for ordered observations 3=13657
 performance prediction, range finder systems 3=18773
 time interval distribution, discrete binomial 3=1579
 wave-form product distrib., mean and variance 3=16

Projectiles

See Ballistics.

Projectors, optical

No entries this year

Promethium

diffusion, anomalous, in Ag and Pb 3=13005

Promethium compounds

Pm sesquioxide, crystal structure, atomic, from X-ray powder reflections 3=18311

Prominences, solar

See Sun, prominences.

Propagation

See Acoustic wave propagation; Electromagnetic wave propagation.

Proportional counters

See Counters, proportional.

Prospecting

See Geophysical prospecting.

Protactinium

No entries this year

Protactinium compounds

No entries this year

Proteins

- crystallography, Fourier functions 3=20811
 DNA bases, free-radical yield, rel. to γ -irrad. 3=22606
 D.N.A., nucleotide "code" sequence for species specificity, review 3=18669
 DNA, transition temp. rel. to base composn. 3=22616
 ear, tectorial and basilar membranes 3=3661
 egg albumen solution, dielectric dispersion, u.h.f. 3=14177
 energy band structure, LCAO MO theory 3=12886
 gelatin, dyed, photoconductivity 3=20413
 haemoglobin, photoconductivity 3=20413
 proton range, 2-75keV 3=14984
 reactions with molecules 3=3383
 X-ray crystallography, review 3=23438
 HgI₂ configuration, rel. to structure detm. 3=15087

Proton spectra

- $d + p \rightarrow p + p + n$, 24.35 MeV 3=24806
 (d,p) stripping, "gross structure" 3=6293
 knock-on, from π^- -emulsion interacts. 3=17312
 Λ_{e3} decay 3=7930
 $p + D \rightarrow 2p + n$, 5-10 MeV, meas. 3=19711
 (p,p'), (d,p) on 15 rare earth nuclides at 12 MeV 3=22285

Proton spectra—contd

- π^- -p collisions, 6 GeV/c, momentum distrib. 3=15010
 from proton induced nuclear reactions 3=8100
 recoil, counter-geometry effects 3=19631
 Al(γ , p) 3=4614
 Al²⁷(n,np), 14.8 MeV, by cpd. nucleus theory 3=17481
 Al²⁷(n,p)Mg²⁷, 14.8 MeV 3=19861
 B^{10,11}(p,2p), 155 MeV 3=6232
 B¹¹(α , p)_nC¹⁴, 2.5 to 5.0 MeV 3=19770
 B¹¹(d, p)B¹² 3=4664
 Ba¹³⁸(d,p)Ba¹³⁹ 3=2360
 Be⁸ 3=10250
 Be⁹(p,2p), 155 MeV 3=6232
 C, photoprotons 3=2434
 C¹²(d,p)C¹³ 3=8128
 C¹²(γ , p), at 31 MeV photons 3=663
 C¹²(p', p' α), 15-29 MeV 3=2458
 C¹²(p,2p), 155 MeV 3=6232
 C¹²(t,p)C¹⁴, 0.32 to 1.18 MeV 3=15327
 Ca⁴⁰(α , p)Sc⁴³, α -rays up to 20 MeV 3=12700
 Ca⁴⁰(γ , p)K³⁹, up to 22 MeV 3=6226
 Co⁵⁹(n, p) 14.8 MeV 3=19861
 CsI; Tl (n,p), 14 MeV 3=12689
 Cu⁶³(p,p'), 11 MeV 3=10338
 D(n,p)2n, 14.4 MeV 3=17350
 Dy¹⁶³(d,p)Dy¹⁶⁴ 3=22285
 He³-t reactions at 1.9 MeV 3=7939
 He⁴(γ , np)D³ 3=6093
 Λ He² \rightarrow He⁴ + p + π^- 3=6148
 La¹³⁹(d,p)La¹⁴⁰ 3=2360
 Li⁶(p,pd), 155 MeV, calc. 3=22386
 Li^{6,7}(p,2p), 155 MeV 3=6232
 Li⁷ photodisintegration 3=24921
 Mg, photoprotons 3=10325
 Nb⁹³(γ , p), 19.5-27.5 MeV, rel. to statist. theory 3=24922
 Ne²⁰(γ , p), 23.5 MeV 3=10327
 Ni⁶²(p,p'), 11 MeV 3=10338
 O¹⁶(γ , p), giant res. up to 170MeV 3=8076
 O¹⁶(p,p' α), 15-29 MeV 3=2458
 Pb(γ , p) at 22.5 and 33.5 MeV 3=6219
 Pr¹⁴¹(d,p)Pr¹⁴² 3=2360
 Pr¹⁴¹(γ , p) at 22.5 and 33.5 MeV 3=2432
 Pt(γ , p) at 22.5 and 33.5 MeV 3=6219
 Pt(γ , p), 22.5 and 33.5 MeV 3=2433
 Rh(γ , p) at 22.5 and 33.5 MeV 3=6219
 S³²(n,p)P³² 3=19862
 S³², photoprotons 3=19832
 S³², photoprotons 3=15172
 Se⁷⁶(d,p)Se⁷⁷, 7.8 MeV 3=17495
 Si(n, p)Al, 6-9 MeV n's 3=19867
 Si²⁸(n,p), up to 5.5 MeV 3=10359
 Si²⁸(d, p)Si³⁰ 3=4867
 Sm¹⁴⁹(d,p)Sm¹⁵⁰ 3=22285
 W(γ , p), 22.5 and 33.5 MeV 3=2433
- Protons and antiprotons**
 See also Cosmic rays, protons; Nuclear reactions, protons; Nucleons and antinucleons.
 acceleration to 75 MeV in ORIC 3=5734
 accel. to 450 MeV in sector-focused cyclotron 3=5777
 beam calibration from knock-on electrons prod. in emulsion 3=4387
 beam, energy dispersion, charge-transfer 3=21896
 beam plotting using photoelectrets 3=15622
 Colorado cyclotron, extraction of proton beam 3=5736
 cyclotron, for 50 MeV protons, 70 in. 3=5746
 e.m. form factors, energy depend. 3=17277
 electric and mag. form factors meas. 3=12455
 electron capture from O and N atoms 3=15303
 form factors from e-p scatt. analysis 3=14957
 form factors, from electron scatt. at 100-250 MeV 3=2243
 form factors meas. 3=14980
 form factor, from scatt., e-d, e-p 3=14971
 geomag. trapped, asymmetry effects at high energy 3=16292
 ionosphere, charge exchange source 3=16242
 mass difference, n-p 3=6009
 n-quantum transitions between spin-Zeeman levels 3=14034
 n-quantum transitions between spin-Zeeman levels 3=14035

Protons and antiprotons — contd

- pairing correl. in nuclei 3=12542
- pairing energy in nucleus 3=10199
- p-n mass difference 3=7840
- p-n pairs, γ -ray absorpt. 3=15052
- polarizabilities, elec. and mag., higher-order terms 3=571
- polarized beam, precession of proton spins 3=12456
- spin and charge states, generalized field theory 3=24603
- synchrotron, 300-1000 GeV, experimental techniques 3=17004
- transfer, in collisions between nuclei 3=6296

absorption

- air, stopping cross-section 40-250 keV 3=22133
- explosives, range-energy relationships 3=17279
- hydrocarbon gases, stopping cross-section 40-250 keV 3=22133
- in moderators and absorbers, free model 3=22460
- by nuclei, 25 BeV/c, nuclear radius 3=12649
- VYNS films, energy loss at 4-30 keV 3=4394
- Al₂O₃ films, energy loss at 4-30 keV 3=4394
- C films, energy loss at 4-30 keV 3=4394
- He, stopping cross-section 40-250 keV 3=22133
- in Si, range-energy relationship 3=17113

angular distribution

- from (α , p) reactions on light and medium-wt. nuclei 3=19883
- (d, p) nuclear reactions 3=24965
- d(d, p), 120-200 keV 3=22218
- (d, p) reactions, distorted-wave calc. 3=2487
- (d, p) stripping, rel. to "gross structure" spectra 3=6293
- deuteron stripping in Coulomb field 3=6287
- from elastic scatt., on photographic emulsion nuclei 3=4633
- from γ + d 3=4424
- by γ , 22 MeV bremsstrahlung, on $13 \leq Z \leq 50$, $p > 8$ MeV 3=19830
- p-n scatt., 200 MeV 3=7866
- (p, 2p) ang. correl. in DWBA 3=19841
- p-S³² elast. scatt. 3=6240
- peaks near 180°, due to compound nuclear levels 3=17459
- photonuclear reactions, rel. to surface nuclear shape and optical anisotropy 3=15087

- Ag(α , p) 3=4669
- Al(α , p) 3=4669
- Al(γ , p) 3=4614
- Al, photoprotons 3=10326
- Al²⁷(n, p)Mg²⁷, 14.8 MeV 3=19861
- Al²⁷(p, p')Al²⁷, peaks, 6.5 MeV p 3=22375
- Au(α , p) 3=4669
- B¹⁰(d, p)B¹¹, l-values 3=680
- B¹⁰,¹¹(p, 2p), 155 MeV 3=6232
- B¹¹(α , p)C¹⁴, 2.5 to 5.0 MeV 3=19770
- B¹¹(d, p)B¹² 3=4664
- Be⁹(He³, p)B¹¹, 2.0 MeV 3=22269
- Be⁹(p, 2p), 155 MeV 3=6232
- Bi²⁰⁸(d, p)Bi²¹⁰ 3=681
- C (polystyrene), scatt., at 100-200 keV 3=6238
- C scatt., 5.2-6.6 MeV 3=22292
- C¹²(α , p)N¹⁵, E _{α} < 35 MeV, peaks near 180° 3=17459
- C¹²(d, p γ), p- γ ang. correls. 3=679
- C¹²(t, p)C¹⁴, 0.32 to 1.18 MeV 3=15237
- C¹² + C¹², 123 MeV 3=17500
- C¹²(d, p)C¹³ 3=8128
- C¹² + Li⁶ → O¹⁷ + p 3=8136
- C¹²(p, 2p), 155 MeV 3=6232
- C¹²(d, p)C¹⁴, 4.6-6.0 MeV, p- γ ang. correl. 3=24969
- C¹²(d, p)C¹⁴, 3.2-4.1 MeV 3=24970
- Ca⁴⁰(α , p)Sc⁴³, α -rays up to 20 MeV 3=12700
- Ca⁴⁰(γ , p)K³⁹, up to 22 MeV 3=6226
- Cd¹¹¹(d, p)Cd¹¹², 13.6 MeV, and Cd¹¹² levels, spin and parity 3=12592
- and Cd¹¹⁴ spin and parity, from d, p stripping 3=17405
- Co⁵⁹(n, p) 14.8 MeV 3=19861
- Cr⁵⁰,⁵²,⁵⁴, inelastic scatt. at 6.9 MeV 3=22373
- Cu(α , p) 3=4669
- Cu, photoprotons 3=10326
- Cu⁶³(p, p'), 11 MeV 3=10338
- F¹⁹(d, p)F²⁰, 2 MeV 3=22419
- F¹⁹(α , p)Ne²², 14.7 MeV 3=2500
- He⁴(d, p)He⁴, 27 MeV 3=15224

Protons and antiprotons — contd**angular distribution — contd**

- He³, scatt., elastic 3=6005
- He⁴(γ , p)H¹ for 23-32 MeV γ 3=6092
- He⁵ → He⁴ + p + π^- 3=6148
- Li⁶,⁷(p, 2p), 155 MeV 3=6232
- Li⁶(p, pd), 155 MeV, calc. 3=22386
- Li⁶ and Li⁷(p, 2p), ang. correl. distrib. 3=15190
- Li⁶,⁷(α , p)Be⁹,¹⁰, 13.6 and 14.7 MeV 3=2500
- Li⁷ photodisintegration 3=24921
- Mg, photoprotons 3=10325
- Mo⁹⁷(d, p), 13.6 MeV 3=24973
- N¹⁴(He³, p)O¹⁶, 2.5-5.5 MeV 3=15231
- Ne²⁰, scatt., 5.20-6.23 MeV 3=6233
- Ne²²(p, p γ) 3=2449
- Ni⁵⁸,⁶⁰,⁶²,⁶⁴(d, p), at 13.6 MeV 3=2489
- Ni⁵⁸,⁶⁰,⁶²,⁶⁴(p, p'), 4.2 MeV 3=24930
- Ni⁶²(p, p'), 11 MeV 3=10338
- O¹⁶⁻¹⁸(d, p), 15 MeV 3=12583
- O¹⁶(γ , p), giant res. up to 170 MeV 3=8076
- O¹⁶(t, p γ)O¹⁸, p- γ ang. correls. 3=10392
- O¹⁶(t, p)O¹⁸, t of 660-1400 keV 3=19887
- O¹⁷(d, p)O¹⁸ 3=22420
- Pb(γ , p), 22.5 and 33.5 MeV 3=2433
- Pb(γ , p) at 22.5 and 33.5 MeV 3=6219
- Pr¹⁴¹(γ , p) photoprotons at 22.5 and 33.5 MeV 3=2432
- Pt(γ , p) at 22.5 and 33.5 MeV 3=6219
- Pt(γ , p), 22.5 and 33.5 MeV 3=2433
- Rh(γ , p) at 22.5 and 33.5 MeV 3=6219
- S³²(n, p)P³² 3=19862
- Se⁷⁸(d, p)Se⁷⁷, 7.8 MeV 3=17495
- Si²⁸(d, p)Si³⁰ 3=4667
- Si²⁸(d, p)Si³⁰ 3=22420
- Si²⁸(d, p)Si³⁰, 4.3 MeV, calc. 3=6286
- Si²⁸(n, p)Al²⁸, 14 MeV, calc., correction 3=17482
- and Si³⁰ spin and parity, from d, p stripping 3=17405
- Sn¹¹⁷(d, p)Sn¹¹⁸, 13.6 MeV, and Sn¹¹⁸ levels, spin and parity 3=12592
- Sn¹¹⁸(d, p)Sn¹²⁰, 13.6 MeV, and Sn¹²⁰ levels, spin and parity 3=12592
- Te¹²⁵(d, p), 13.6 MeV 3=24973
- W(γ , p), 22.5 and 33.5 MeV 3=2433
- Y⁸⁹(d, p)Y⁹⁰, 15 MeV, and Y⁹⁰ energy splitting 3=15169
- and Zr⁹¹,⁹² spin and parity, from d, p stripping 3=17405

detection, measurement

- antiprotons, selective detection, using Cherenkov radiation 3=10080
- beam current meas., by integrator, digital 3=19138
- Cherenkov counter design, up to 5 GeV/c 3=4297
- emulsions, discrim. from deuterons 3=4304
- polarimeter for 1-2 MeV, parameters 3=24733
- pulse discrim. circuits for high γ -background 3=16892
- scintillation, Ar, liquid, 10-50 MeV 3=19635
- scintillation counter telescope, photo-protons 3=24734
- scintillation counters for 10-50 MeV 3=22035
- scintillator, liquid, NE 213, light output meas. 3=2266
- semiconductor detector using p-type Si, 10-30 MeV 3=5803

effects

- acetylene, ionization, 2.25 MeV 3=20024
- anthracene, luminescence excitation 3=11005
- free radicals, on bombardment, in H₂, D₂, solid, films, e.p.r., 100-1000 V 3=10550
- ionization, energy per ion 3=14522
- ionization of gases, 100-450 keV protons 3=21698
- Permalloy, effect of 10¹⁵-10¹⁷ p/cm² on mag. props. 3=15863
- π -meson prod. on emulsion nuclei at 9 GeV 3=596
- semiconductors, correl. with neutron damage 3=25308
- Al thick targets, 1 MeV protons, secondary emission 3=24344
- Au thick targets, 1 MeV protons, secondary emission 3=24344
- Be thick targets, 1 MeV protons, secondary emission 3=24344
- Cu thick targets, 1 MeV protons, secondary emission 3=24344
- Fe, effect of 10¹⁵-10¹⁷ p/cm² on mag. props. 3=15863
- H atom beam prod. on passing through gas 3=2584
- H atom, metastable state, excitation 3=4716
- H₂, electron capture, calc. 3=16908
- H₁, excitation, Balmer emission meas. 3=15278

Protons and antiprotons — contd effects — contd

- Al, 50-100 keV, electron production 3=14641
- He atom excitation, transitions meas. 3=2560
- LiF, coloration, rel. to growth method 3=25298
- N₂, energy loss per ion pair 3=12081
- Si, defect density rel. to energy, calc. 3=8474
- Si, diffusion 3=22825
- Si, lattice displacements 3=13023
- Si, solar cells, 100, 500 keV 3=14508
- Ta thick targets, 1 MeV protons, secondary emission 3=24344

interactions

See also Nuclear reactions, protons.

- α prod., at 9 GeV, in emulsion 3=19623
- angular correl. pair, secondaries, 9 GeV 3=19622
- capture by B¹¹, giant resonance region 3=15192
- D, continuous neutron spectra meas. 3=6290
- D, mass-3 nuclei prod., high energy, at ~28 GeV, momentum spectra, theory 3=15198
- d-p, at 77 MeV, cross-sections, total and elastic 3=12516
- D(p, γ)He³, below 50 keV 3=15045
- D(p,n), 143 MeV, neutron polariz. 3=10349
- deuterons, photodisintegration, calc., 50-120 MeV 3=12515
- e pair prod., on p, high energies, calc. 3=17256
- electron scatt., elastic, at 100-250 MeV, cross-section 3=2243
- fragment emission, unstable, 25 GeV/c in nuclear emulsion 3=17270
- $\gamma + p \rightarrow \eta + p$, 978 MeV, $\eta \rightarrow 2\gamma$ branching ratio 3=22187
- $\gamma + p$, high energy, μ , e prod. and comparison 3=22157
- $\gamma + p \rightarrow K^+ + \Sigma^0$, low-energy 3=17334
- $\gamma + p = p + \pi^0$ 3=15003
- $\gamma + p \rightarrow p + \pi^0$, at high energies 3=6037
- $\gamma + p \rightarrow p + \pi^- + \pi^+$, 300-800 MeV, rel. to interaction current 3=6035
- $\gamma + p \rightarrow \pi^+ + n$, 200-450 MeV 3=22164-5
- $\gamma + p \rightarrow \pi^+ + n$, 200-260 MeV, fixed momentum transfer 3=22166
- H atoms, electron capture 3=12781
- K⁻, at 1.15 BeV/c, systematic study 3=2321
- K⁻-p, analysis of Y₀^{*} (1520) 3=24793
- K⁻-p, isobaric model at 1150 MeV/c 3=7923
- K⁻-p, 700-1400 MeV/c, spark chamber array for 3=24790
- K⁻ + p \rightarrow $\Lambda + \bar{K} + K$ and $\bar{K}K$ reson., spin and parity 3=17336
- K[±]-p total cross-sections, 3-19 BeV/c 3=10169
- K⁺ + p \rightarrow K⁺ + N₃₃^{*}, 1.96 BeV/c meas. 3=4457
- $\bar{\Lambda}$ -p annihilation, statistical model 3=2324
- mean free path at 3 TeV 3=7849
- with N, in emulsion, 9 BeV 3=17271
- Ne^{21,22}, resonance energies for capture, 600-1400 keV 3=4634
- n-p, at 8.3 BeV, cross-sects. 3=6004
- neutron, mag. dipole interact. in deuteron 3=4398
- in nuclear emulsion, knock-on electrons by 26 GeV protons 3=4387
- nuclear emulsions, at 25 GeV, meas. 3=7847
- with nucleons, in emulsions, π^\pm production 3=6001
- with nucleons, at 25 GeV, in emulsion 3=7848
- with nucleons, strange particle prod. calc. 3=7927
- p- α , in C¹² nucleus 3=12551
- p + C¹² \rightarrow d + C¹¹, scatt. approx. for long range forces 3=2222
- p + d \rightarrow H³ + $\pi^+ + \pi^0$, H³ spectrum 3=4390
- p + d \rightarrow He³ + $\pi + \pi$ 3=17318
- p + d \rightarrow He³ + X, rel. to π - π , I = 0, resonance 3=4430
- p + d \rightarrow p + p + n, 77 MeV, cross-sections 3=22129
- p + D \rightarrow 2p + n, 5-10 MeV, proton spectra 3=19711
- p + $\gamma \rightarrow \Lambda^0 + K^+$, K^{*} "particle" exchange approx. 3=15041
- p + $\gamma \rightarrow$ p + low-mass anomaly 3=10151
- p + $\gamma \rightarrow \pi^+ + n$ at 160-200 MeV 3=4423
- p- γ , π production 3=4430
- p-K⁻, const. scattering-length analysis 3=4462
- p-n at 8.3 BeV, cross-sections 3=6004
- p-n, form factors for axial vector current 3=7862
- p-n, inelastic, 9 BeV 3=5997
- p-nucleon, up to 10 BeV, review 3=22120
- p-n, in pair correl. model 3=6003

Protons and antiprotons—contd interactions—contd

- p + N + π , coupling consts., direct meas. 3=24594
- p-n potl., scatt. phase shifts 3=7793
- p-N, at 9 BeV in nuclear emulsion, rel. to multiplicity 3=6002
- p-N and p- π , strong, energy losses 3=17274
- p-N, 26.7 GeV/c, effective target mass 3=19627
- p-p, annihilation into electrons and muons 3=14985
- p-p collisions at 3.5 GeV, π -p pair Q's 3=19624
- p + p \rightarrow d + π^+ , cross-section anomalies at 574-648 MeV 3=4389
- p-p, final-state interacts., 560 MeV 3=5998
- p-p, inelastic, 27 GeV, in emulsions, white stars 3=14978
- p-p at 12.8 GeV, nuclear emulsion obs. 3=24716
- p + p \rightarrow K⁺ + K⁰ or $\Lambda + \pi$, meson-baryon exchange competition 3=22135
- p + p \rightarrow $\pi^+ + p + n$, one-boson-exchange model 3=19673
- p-p, spatially extended particle theory 3=7767
- p-p, π production 3=4430
- p-p, 26.6 GeV/c, deuteron and α -particle prod. 3=24717
- p-p, 24.5 GeV/c, strange-particle prod. 3=22206
- p-p, 25 GeV, in nuclear emulsion 3=19628
- p- \bar{p} annihilation, multiple meson prodn. 3=7873
- p-p collisions in flight, one-particle exchange 3=7859
- p- \bar{p} , 15-80 MeV, charge exchange and annihilation cross-sections 3=10110
- $\bar{p} + p$, production of anti-isobar, isobar pairs 3=4395
- $\bar{p} + p \rightarrow e^- + e^+$ search and time-like p structure 3=19629
- $\bar{p} + p \rightarrow \Lambda^0 + \bar{\Lambda}^0 + \pi^+ + \pi^-$, 3.25, 3.69 BeV/c, Y₁^{*}, Y₁^{*}, Y₁^{*}- + Y₁^{*}+ pair, prod. 3=22209
- p + $\bar{p} \rightarrow \pi^- + \pi^+$, π annihilation 3=4391
- $\bar{p} + p \rightarrow \pi^+ + \pi^- + \pi^0$ 3=10117
- p + $\bar{p} \rightarrow 2\pi^+ + 2\pi^- + \pi^0$, asymmetry energy dependence 3=17272
- $\bar{n} + n \rightarrow 3\pi^+ + 3\pi^- + \pi^0$, multipion reson. 3=2258
- p- π , 6.1-18.1 GeV/c, charge exchange cross-sections 3=15011
- p- π , π production 3=4430
- p + $\pi^- \rightarrow \Lambda + K^0$, rel. to $\Lambda\Sigma$ parity 3=4462
- p + $\pi^- \rightarrow \pi^0 + n$, charge transfer 3=7884
- p- π^- , at 3.4 - 9.2 BeV/c 3=6042
- p- π^- , 16 GeV/c, strange particle prodn. 3=15012
- p + $\pi^- \rightarrow \Lambda^0 + K^0$ 3=6043
- p + $\pi^- \rightarrow \pi^- + n + \pi^- + \pi^+ + \pi^+$, 4 GeV/C 3=4434
- p + $\pi^- \rightarrow \pi^- + p + \pi^- + \pi^+ + \pi^0$, 4 GeV/C 3=4434
- p + $\pi^- \rightarrow \pi^+ + \pi^- + n$, 240 MeV 3=17318
- $\pi^+ \pi^- \rightarrow \pi^+ + \pi^- + n$, 200-700 MeV, strip approx. inapplicability 3=2295
- π -p pairs from p-p collisions at 3.5 GeV, Q values 3=19624
- π -p, Panovsky ratio, by γ - γ coinc. meas. 3=24769
- π -p, $\pi^+\pi^-$ production, f⁰ resonance obs. 3=22168
- π -p, at 600 MeV, in liquid H bubble chamber 3=7904
- $\pi^+ + p \rightarrow K^+ \Sigma^+$, cross-section near threshold 3=14928
- $\pi^\pm + p \rightarrow N + 2\pi$, isotopic spin indep. 3=7808
- $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, high momentum transfer, Regge-pole π behaviour 3=22173
- $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, spark chambers, low track material, 3=24563
- π^- -p, 7.2 BeV, multiple pion prod. 3=24767
- $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, one-pion-exchange model 3=7893
- $\pi^- + p \rightarrow \pi^- + p + \pi^- + \pi^+$, 900 MeV, meas. 3=10149
- π^- -p, 7.8 GeV, Λ and K⁰ production 3=24798
- π^- -p, 7 GeV, two non-neutral secondaries 3=17311
- π^- -p, 340 MeV, pion prod. meas. 3=22176
- π^- -p, 276 MeV, total cross-sections 3=22177
- $\pi^- + p$, 6.8 BeV/c, Λ , K⁰ prod. 3=22208
- $\pi^- + p$ and K π reson. at 726 MeV 3=19698
- $\pi^- + p \rightarrow K + \bar{K} + N$, from $\bar{K}K$ reson. width 3=17337
- $\pi^- + p \rightarrow n + \pi^- + \pi^+$, 1.7 BeV/c, and ω decay, 2 π mode 2=19692
- $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ and f⁰ $\rightarrow \pi^+ + \pi^-$ 1260 MeV reson. 3=17313
- $\pi^- + p \rightarrow \pi^+ + \pi^- + n$, deviation from one-pion exchange 3=19675
- $\pi^- + p \rightarrow \pi + \pi + N$, 3 BeV/c, and π - π scatt. 3=19686
- $\pi^- + p \rightarrow \pi^- + \pi^+ + n$, 360-800 MeV meas. 3=17316
- $\pi^- p \rightarrow \pi^- p \omega^0$, and $\pi^- \omega^0 \rightarrow \pi^- \omega^0$ 3=19678

Protons and antiprotons—contd
interactions—contd

- π^- at rest + $p \rightarrow \pi^0 + n$ to stopped π , ratio, in LiH, CH₃ and CH₄ 3=19677
- $\pi^- + p \rightarrow Y_2^* + K$, Y_2^* search 3=17349
- polarized p-e collisions, high energy 3=12435
- proton-proton, pion production 3=4388
- with solar flare plasma, cosmic rays, and electron density 3=11546
- with π^+ -mesons, 820-1050 MeV, single π prod. 3=7888
- $\Sigma^- + p \rightarrow n + \Sigma^0$ or Λ , low-energy calc. 3=10176
- $\rho - \mu^-$, radiative capture 3=14996
- 25 GeV/c, pulsed mag. study of surviving baryons 3=19626
- 26 GeV jets, azimuthal symmetry in shower particles 3=4483
- 3-28 GeV 3=10071

magnetic moment

- in Bohr magnetons, meas. method 3=7846
- contribution to mag. susceptibility of water 3=23907
- gyromagnetic ratio, meas., appl. to current, electrical, unit 3=21189
- in nuclear magnetons, meas. method 3=7845

polarization

- α -p scatt., 4.7-11.9 MeV 3=24728
- deuteron photodisintegration, 294 MeV 3=22217
- (d, p) reactions with $l=0, 1$ orbital ang. momentum transfer 3=682/3
- in elastic scattering and stripping reactions 3=19880
- electric and mag. polarizabilities, estim. 3=24674
- from $\gamma + n \rightarrow p + \pi^-$ in deuterium, near 715 MeV 3=10115
- magnetic polarizability, rel. to γ -ray scattering 3=15170
- in neutron irradi. polymers 3=25580
- in p-C scatt., 28 MeV 3=8085
- p-He⁴ scatt., 22-48 MeV 3=22131
- p-He⁴ scatt., 38.4 MeV, phase-shift analysis 3=22132
- p- Λ , rel. to Λ decay S waves 3=4460
- p,p' γ reactions, correl. with photons direction 3=15191
- pp scattering, elastic, 3, 3.6 GeV/c 3=19630
- p-p scatt., 27-100 MeV 3=10111
- p-p scatt., 30 and 50 MeV 3=22123
- p-p scatt., high energies 3=14979
- in p- π scattering 3=6054
- $\pi^+ \rightarrow p$ collisions at 265 MeV, recoil protons 3=24730
- π -meson photoprod. on protons, ($\gamma, 3\pi$) effect 3=2296
- polarimeter for 1-2 MeV, parameters 3=24733
- in polyethylenes, n irradi., and relax., 1.6, 4.2, 77°K 3=20064
- polymers, meas. by neutron irradi. 3=10114
- prod., possible, by nuclear spin cooling by paramag. electron spins in lattice 3=19077
- recoil protons, in 310 MeV elastic π -p scatt. 3=10158-9
- scattered by complex nuclei, 40 MeV meas. 3=24731
- scattering with neutrons at 23.1 MeV 3=10121
- source of polarized protons for linear accelerator 3=24732
- Al²⁷(d, p)Al²⁸, at 15 MeV 3=682
- B¹⁰(d, p)B¹¹, 13.8 MeV 3=15222
- B(γ , p) 3=4624
- Be(γ , p) 3=4624
- Be⁹(d, p)Be¹⁰, 13.8 MeV 3=15222
- C, elastic scatt. at 6.5 MeV, meas. 3=2444
- C elastic scatt., 660 MeV 3=15189
- C(γ , p) 3=4624
- C¹²(d, p)C¹³, at 15 MeV 3=683
- C¹²(d, p)C¹³, $E_{\gamma} = 0.8-1.2$ MeV 3=2490
- C¹²(d, p)C¹³, 5.5-12 MeV, meas. 3=22422
- C¹², elastic scatt., 3 MeV 3=2443
- C¹², elastic scatt., 3.76-4.65 MeV 3=2445
- by C¹² scattering, elastic, 6.3 MeV 3=22371
- Ca⁴⁰(d, p)Ca⁴¹, 13.8 MeV 3=15222
- Ca⁴⁰(d, p)Ca⁴¹, at 15 MeV 3=683
- (Ce, La)₂Mg₃(NO₃)₁₂·24H₂O, 170 times increase 3700 Oe at 1.6°K 3=20065
- Cu, 9.4 MeV elastic scatt. 3=12661
- D interactions, above 1 BeV/c, n as "spectator" 3=17269
- He³(d, p)He⁴, ~2 MeV deuterons 3=22220
- He³(d, p)He⁴, 3-12 MeV 3=15049
- Li(γ , p) 3=4624
- Li⁷(p, α)He⁴ reaction study 3=2459
- Mg²⁴(d, p)Mg²⁵, at 15 MeV 3=683

Protons and antiprotons—contd

polarization—contd

- Ni^{58,60}(d, p)Ni^{59,61} 13.8 MeV 3=15222
- O¹⁶, elastic scatt., 3.76-4.65 MeV 3=2445
- O¹⁶(d, p)O^{17*} (0.87 MeV) 3=22421
- O¹⁷(d, p)O¹⁸ 3=22420
- Si²⁸(d, p)Si²⁹, 13.8 MeV 3=15222
- Si²⁸(d, p)Si²⁹, at 15 MeV 3=682
- Si²⁹(d, p)Si³⁰ 3=22420
- V⁵¹(d, p)V⁵², at 15 MeV 3=683

production

- by γ , 22 MeV bremsstrahlung, on $13 \leq Z \leq 50$, $p > 8$ MeV, ang. distrib. 3=19830
- π^- absorpt. in nuclei 3=10372
- by proton beam, 30 GeV, on Al, Be, Fe 3=6090
- proton-proton collisions at 3.5 GeV 3=2260
- proton-proton collisions, 19.8 GeV/c 3=2259
- retarded, in positron decay, in light nuclei with neutron shortage 3=6197
- source of polarized protons for linear accelerator 3=24732
- N¹⁵, by photons, 24.5, 31 MeV 3=17452
- Pr¹⁴¹(γ , p) at 22.5 and 33.5 MeV 3=2432
- S³², photoprotons 3=15172

scattering

- α , 39.8 MeV, polarization, phase-shift analysis 3=24729
- α -p, 4.7-11.9 MeV, proton polarization 3=24728
- antiprotons, elastic, rel. to TCP theorem 3=2264
- backward peak, narrow, 2-3 GeV, explanation 3=12464
- bremsstrahlung from bombardment of nuclei 3=14947
- at collimator slit, calc. 3=5719
- complex nuclei, 40 MeV, polarization meas. 3=24731
- by complex nuclei, 27 GeV, inelastic 3=15187
- Compton effect, dipole "phase shift" approx. 3=5975
- Compton effect, use of dispersion relns. 3=24674
- by deformed nucleus, elastic 3=2441
- DWBA validity range 3=19829
- e-p, at high momentum transfer 3=14958
- e-p, inelastic, 3/2 reson. in isobaric model 3=19611
- e-p, momentum transfer $q^2 \leq 2$ fermi⁻² 3=14980
- e-p. statistical analysis 3=14957
- e-p, two-photon exchange contribution, calc. 3=17247
- elastic and inelastic, in cyclotron of Ukrainian Acad. of Sciences 3=19880
- elastic, 9 to 22 MeV, optical model analysis 3=19839
- elastic, on photographic emulsion nuclei 3=4633
- electron pickup on collisions with atoms 3=10476
- electrons, dispersion theory analysis 3=2244
- form factor, time like, from $\bar{p} + p \rightarrow e^- + e^+$ search 3=19629
- of γ , 500-850 MeV, 90°, and (1, 3) isobar 3=19601
- inelastic, 10 MeV, various elements 3=10340
- by K mesons, up to 800 MeV/c, ρ and ω reson. exchange contrib. 3=15034
- K⁺-mesons, elastic, at 970, 1170, 1970 MeV/c 3=10171
- K⁺-p, low-energy, repulsion effects 3=17338
- K⁻-p, 700-1400 MeV/c, spark chamber array for 3=24790
- Λ -hyperons, elastic, meas. 3=7931
- Λ and K_s⁰ particles, elastic, meas. 3=6086
- on light nuclei, inelastic, rel. to anisotropic distrib. in nucleus 3=6239
- metals, slowing-down by elastic collisions, theory 3=22691
- μ -meson and electron, scatt. 3=17301
- μ -p, 1.2 BeV/c, elastic, meas. 3=24757
- μ -p, inelastic, 3/2 reson. in isobaric model 3=19611
- multiple scattering, microphotometric investigation 3=24718
- neutron, total cross-section at 0.4926 and 3.205 MeV 3=4399
- nuclear excitation, 3⁻ octupoles 3=19764
- nuclei of masses 50-70, polarized p's, 14 MeV, large angle isotopic, isotonic and shell closure effects 3=15186
- nuclei, quasi-elastic, distortion effects 3=8064
- nucleons, primary energy determination, 27 GeV 3=17262
- nucleus, coulomb field, inelastic 3=8068
- nucleus, elastic and inelastic, optical model 3=12662
- p-e, energy depend. of form factors 3=17277
- p-e, enhancement, rel. to Regge trajectories 3=2207

Protons and antiprotons — contd
scattering — contd

- p-e, i.r. singularities 3=5988
p-e, 1 and 4 BeV, Rosenbluth formula deviation search 3=19613
p-e, quantum electrodynamics 3=17165
p-e, rel. to dipole moments 3=14956
p-e, threshold behaviour, close-coupling effects 3=22502
p- γ , elastic, η -meson and scalar boson contrib. 3=17233
p-H atom, rearrangement collisions 3=4722
p-He⁴, 22-48 MeV, p polarization 3=22131
p-He⁴, 38.4 MeV, p polarization, phase-shift analysis 3=22132
p-He⁴, and potential, 40 MeV 3=22256
p-Mg, elastic, 5.45 MeV 3=2450
p- μ , 12 GeV/c 3=10140
p-N, Dirac monopoles prodn. cross-section 3=14861
p-n and d form factor 3=19712
p- π , elastic, rel. to vector particle pole diagram 3=15023
p- π scattering, polarization and charge exchange 3=6054
p- π total cross-section, 2 to 3 BeV 3=22183
p- π^+ , elastic, 7.2 BeV, 4^o-28.3^o ang. range 3=6058
p- π^- , 7 to 20 BeV/c, elastic 3=17323
p- π^\pm , 500-1600 MeV 3=10161
(p, 2p) ang. correl. in DWBA 3=19841
 π -p, Chew-Low theory, role of CDD poles 3=19680
 π -p, diffraction peak, non-shrinking, dispersion theories 3=17321
 π -p, elastic, at 310 MeV, proton polarization 3=10158-9
 π -p, non-shrinkage 3=14916
 π -p, study using thin-plate spark chambers 3=24565
 π -p, at 600 MeV, in liquid H bubble chamber 3=7904
 π -p, at 7 BeV, multiple pion prod. 3=15018
of π^- , elastic cross-sections 3-5 GeV/c, and Regge pole hypothesis 3=6050
 π^- -mesons, at 7.2 BeV, π - π interaction 3=6053
 π^- -mesons, 152 and 226 MeV, elastic 3=4441
 π^- -p, elastic, 10 GeV/c 3=17324
of π^- , total cross-sections, 2-5 BeV/C 3=6049
 π^\pm -p, elastic, 31.4 MeV, phase shifts 3=22178
 π^\pm -p, high energy, forward, real part, and π -N dispersion 3=22186
 π^+ -p, 1.5, 2.0 and 2.5 BeV/c, elastic meas. 3=12490
 π^+ -p, 7-17 BeV/c, and Regge pole theory 3=19688
 π^+ -p, 265 MeV, elastic, polarization of recoil protons 3=24730
 π^+ -p, 310 MeV, phase shift analysis, modified 3=24779
of π^+ , elastic, cross-sections, 3 GeV/c, and Regge pole hypothesis 3=6050
positrons, rel. to two-photon exchange 3=2248
rare-earth isotopes, inelastic, rel. to rotational levels 3=17458
scattering chamber using junction counters 3=17095
search for Dirac magnetic monopole 3=10069
by spherical nuclear potential with diffuse boundary 3=12660
tritons, elastic, below 1 MeV 3=15047
resonant, by Woods-Saxon nuc. potl. 3=22281
by A⁴⁰, elastic, 1-1.95 keV 3=7991
B^{10,11}(p,2p), quasi-free, 155 MeV 3=6232
Be⁹(p,2p), quasi-free, 155 MeV 3=6232
C, elastic, 660 MeV, at small angles 3=22374
C, elastically, polarization meas. 3=2444
C, 5.2-6.6 MeV, excitation functions 3=22292
On C, 17 MeV protons, rel. to optical model 3=12663
C, 28 MeV, polarization 3=8085
by C, 660 MeV, small-angle, elastic 3=15189
C (polystyrene), multiple 3=6238
by C¹², elastic, polarization meas. 3=2445
by C¹², elastic, 5-11.5 MeV 3=635
C¹², 155 MeV, inelastic, calc., from energy levels 3=19768
C¹², elastic, at 10-11.5 MeV, overlapping resonances analysis 3=24928
C¹², elastic, 3 MeV 3=2443
C¹², inelastic, 14-20 MeV, with or without γ -emission 3=2447
by C¹² nuclei, 660 MeV 3=4630
C¹²(p, p')C^{12*}, threshold to 50 MeV 3=19838
C¹²(p,2p), quasi-free, 155 MeV 3=6232
on C¹⁴, quasi-elastic, at 185 MeV 3=10336

Protons and antiprotons — contd
scattering — contd

- C¹² 31.1 MeV, elastic and inelastic 3=6236
C¹², 6.3 MeV, elastic, polarization 3=22371
by C¹², 182 MeV, impulse approx. 3=15184
Ca⁴⁰, inelast. at 6.6 MeV 3=6237
Ca⁴⁰(p,p'), at 150 MeV 3=10342
on Ca⁴⁰, quasi-elastic, at 185 MeV 3=10336
Cr^{50,52,54}, inelastic, 6.9 MeV meas. 3=22373
Cr⁵² 3=4665
Cr, optical model analysis 3=12662
Cr^{52,53,54}, elastic, 6.9 MeV, ang. distrib. 3=17457
Cu, 0.4 MeV, elastic, polarization 3=12661
on Cu, 17 MeV protons, rel. to optical model 3=12663
Cu⁶³(p,p'), 11 MeV 3=10338
F¹⁹, resonance, Coulomb excitation 3=12572
Fe, optical model analysis 3=12662
H atoms, inelastic, degeneracy effects 3=4721
H μ -mesic atom 3=6371
by He³, elastic, 2.0-4.8 MeV, phase shifts 3=6005
He³ nuclei at 29 MeV, elastic 3=7860
In, inelastic, 30 and 2.9 GeV meas. 3=2460
Li⁶, by p-proton, quasi-elastic calc. 3=2442
Li⁶, elastic, phase shift analysis 3=15188
Li⁶,⁷(p,2p), quasi-free, 155 MeV 3=6232
Mg²⁴, elastic, 1450-4200 keV 3=22372
Mg²⁴, 6.9 MeV 3=19840
Mg²⁴(p,p'), 2.7-4.2 MeV 3=6234
Mn⁵⁵ and Ho¹⁶⁵, 5, 14 MeV, elastic 3=19828
Mn⁵⁵, inelast., at 6.6 MeV 3=6237
N¹⁴, 1-2 MeV, elastic, diff. cross-sections 3=12582
N¹⁴(p,2p) quasi-elastic, and hole-excitation spectrum 3=8086
Na²³, 850-910 keV, reson. inelastic, γ yield, lack of asymmetry 3=24929
Ne²⁰, ang. distrib., cross-sections, 5.20-6.23 MeV 3=6233
Ne²⁰(p,p'), inelastic, at 2-3 MeV 3=4632
Ne²²(p,p') 3=2449
Ni, optical model analysis 3=12662
Ni^{58,60}, elastic, excitation function, 7-12 MeV 3=22370
on Ni^{58,60,62,64}, elastic scatt., 4.2 MeV 3=24930
Ni⁶⁰(p,p'), 4.4 to 5.0 MeV 3=10343
Ni⁶²(p,p'), 11 MeV 3=10338
Ni⁶⁴, inelastic, 9.6-11.7 MeV 3=10259
Ni⁶⁴, 9.6 and 11.7 MeV, elastic 3=10339
O, elastic, 8.66-19.2 MeV, optical model analysis 3=6235
O₂, two-state and multistate excitation 3=25104
O¹⁶, elastic and inelastic, differential cross-sections 3=4631
by O¹⁶, elastic, phase shift analysis 3=2446
by O¹⁶, elastic, polarization meas. 3=2445
O¹⁶, inelastic, at 150 MeV, meas. 3=2451
on O¹⁶, quasi-elastic, at 185 MeV 3=10336
P³¹, elastic, study of S³³ energy levels 3=7988
Pb²⁰⁸⁻⁹, inelastic, rel. to config. mixing 3=8020
S³² 5.7-6.34 MeV 3=6240
Si³⁰, elastic, 1-3.65 MeV 3=17456
T, elastic, 990 keV, phase shift analysis 3=22130
by Ta, elastic, theory and expt. 3=2441
Ti, optical model analysis 3=12662
Zn, optical model analysis 3=12662
Zn⁶⁶, inelastic, 9.6-11.7 MeV 3=10259
Zn⁶⁴, 9.6 and 11.7 MeV, elastic 3=10339
Zn^{64,66,70}, elastic, 6.9 MeV, ang. distrib. 3=17457
Zn^{64,66}(p, p'), 4.4 to 5.0 MeV 3=10343
scattering, proton-deuteron
d-p, 24.35 MeV, d disintegration 3=24806
elastic triple scatt., 140 MeV, R and A parameters 3=22127
inelastic, impulse approx, calc. 3=7851
inelastic, slightly, meas. at 158 MeV 3=7850
quasifree, impulse approx. interpret. 3=22128
77 MeV, cross-sections 3=22129
77 MeV, cross-sections, total and elastic 3=12516
scattering, proton-neutron
See Neutrons and antineutrons, scattering, proton-neutron.
scattering, proton-proton
analytic amplitude for determ. of nucleon-meson coupling const. 3=19625
boson exchange model 3=7853

Protons and antiprotons—contd**scattering, proton—proton—contd**

- comparison with π -p scatt., using only three Regge poles 3=14983
- cross-sections, Chew—Low extrapolation method 3=22129
- depolarization, 50 MeV 3=17275
- diffraction peaks, shrinkage 3=2121
- Dirac monopoles prodn. cross-section 3=14861
- dispersion reln. study at 10 MeV 3=10116
- dynamical effects of molecular electrons 3=1618
- effective radius theory, detm. by Mandelstam dispersion relations 3=2265
- elastic, above 10 GeV, rel. to ang. distrib. shrinking 3=4360
- elastic and inelastic, 3.5 GeV meas. 3=2260
- elastic and inelastic, 19.8 GeV/c, meas. 3=2259
- elastic cross-section at high momentum transfers 3=7854
- elastic diffraction, 3-28 GeV 3=10071
- elastic, \sim GeV, hard core disappearance explanation 3=24725
- elastic, 5.2 BeV, in photog. emulsions 3=6000
- elastic, 1.35-2.9 BeV, meas. and theory 3=2262
- elastic, rel. to vector particle pole diagram 3=15023
- elastic, 19.2 GeV/c, on free protons 3=12458
- elastic, 6.2 BeV, 325 cases 3=24726
- elastic, 8.35 BeV, differential cross-sections 3=24727
- elastic, 24 GeV/c, cross-sections 3=7856
- high-energy, Coulomb interference 3=5999
- high-energy, elastic and shrinking diffr. width? 3=14917
- inelastic bump at high energies, final-state interaction 3=24719
- inelastic, 1.35-2.9 BeV, rel. to one-pion-exchange 3=2261
- on Li^6 and Li^7 , quasi-free 3=15190
- $\text{Li}^{6,7}$, quasi-free, distorted-wave analysis 3=2448
- and mesons, vector, exchange, 170 MeV 3=17264
- optical model, high momentum transfer, simple power law 3=17278
- p-p diffraction peaks, shrinkage 3=22121
- $p + p \rightarrow W + d$, theory 3=10112
- $\bar{p}p$, 3, 3.6 GeV/c, elastic, polarization, differences from pp 3=19630
- \bar{n} -n difference, one-pion-exchange contrib. 3=4396
- $\bar{p} + p \rightarrow e^- + e^+$ search and time-like p structure 3=19629
- partial waves, higher, and 3-meson model 3=14981
- phase-shift analysis including absorpt. effects 3=10113
- phase-shift analysis, 660 MeV 3=24722
- phase shift, 660 MeV 3=24723
- phase-shift analysis 210 MeV 3=2257
- π^0 -meson prod. at 735 MeV meas. 3=24724
- π -meson prod., charged, at 1 GeV, models 3=2297
- π -meson prod., 2.9 BeV, meas. rel. to theory 3=6034
- polarization effects at high energies 3=14979
- polarization, 27-100 MeV 3=10111
- polarized protons, at 20 MeV 3=2263
- quasifree, impulse approx. interpret. 3=22128
- quasifree, 140 MeV, R and A parameters 3=22126
- reduction to "necessary expt." in matrix meas. 3=22125
- shrinking, strong, due to interference with lower vacuum trajectories 3=19582
- singularities in ang. momentum plane 3=10054
- spin correl. C_{nn} and amplitude moduli at 640 MeV 3=22124
- spin correl. meas. at 400 and 450 MeV 3=7852
- 3-meson model for 0-320 MeV range 3=22122
- triple, 660 MeV, parameter R angular dependence 3=14982
- 0.97 GeV, elastic, obs. differential cross-section 3=17276
- 0-30 GeV, large-angle, "compound-elastic" theory 3=7909
- 2-20 BeV, and π on n 3=7911
- 2.8 BeV, elastic 3=6007
- 7 to 20 BeV/c, elastic 3=17323
- 8.5 BeV, elastic 3=4393
- 9.7-345 MeV, phase-parameter representation 3=584
- 30 and 50 MeV, polarizations, phase-shifts 3=22123
- 52 MeV, 6 parameter phase shift 3=24721
- 52 MeV, spin correl. coeff. C_{nn} meas 3=24720
- 141 MeV, Wolfenstein R-parameter meas. 3=12456
- 141 MeV, Wolfenstein A-parameter meas. 3=12457
- 142 MeV, phase shifts analysis 3=12454
- at 150 MeV, phase analysis 3=4392

Protons and antiprotons—contd**scattering, proton—proton—contd**

- 380 MeV, spin correlation experiments 3=7855
- 660 MeV, phase shift analysis 3=7857
- 660 MeV, spin correl. coeff. meas. 3=6006

antiprotons

- annihilation, covariant statistical treatment 3=19632
- annihilation into e^-e^+ pair, 2-photon exchange 3=12442
- annihilation in H, two-meson, at 1.61 BeV/c 3=19634
- annihilation, $p + \bar{p} \rightarrow e^+ + e^-$, two-photon exchange contribution, calc. 3=17247
- annihilation producing two mesons, octet model 3=583
- annihilation, strange particle and isobar prod. 3=7858
- antiprotons annihilation and ω^0 decay, neutral modes proportion 3=17328
- collisions with p, production of anti-isobar, isobar pairs 3=4395
- deceleration and capture in matter 3=6008
- deuteron total and inelastic cross-sections, 0.5-1 BeV 3=586
- interactions in H, 1.61 BeV/c, yielding 2 charged particles 3=19633
- nucleon-interaction cross-sections, 0.5-1 BeV 3=586
- $\bar{p}p \rightarrow \bar{B}B$ (Bisa baryon), 3 GeV/c 3=17280
- $\bar{p}p$ collisions in flight, one-particle exchange 3=7859
- $\bar{p}-p$, 15-80 MeV, charge exchange and annihilation cross-sections 3=10110
- $\bar{p}-p$ annihilation, multiple meson prodn. 3=7873
- p-p annihilation, rel. to Regge trajectories 3=22134
- $\bar{p} + p$ annihilation, rel. to 3π , I = 0 resonance 3=4430
- $\bar{p} + p \rightarrow e^- + e^+$ search and time-like p structure 3=19629
- p-p interactions, up to 10 BeV, review 3=22120
- p-p scattering, diffraction peaks, shrinkage 3=22121
- $\bar{p} + p \rightarrow \Lambda^0 + \bar{\Lambda}^0 + \pi^+ + \pi^-$, 3.25, 3.69 BeV/c, Y_1^* , Y_1^{*+} , $Y_1^{*-} + Y_1^{*+}$ pair, prod. 3=22209
- $\bar{p} + p \rightarrow \pi^+ + \pi^- + \pi^0$ 3=10117
- $p + \bar{p} \rightarrow 2\pi^+ + 2\pi^- + \pi^0$, asymmetry energy dependence 3=17272
- $\bar{p} + p \rightarrow 3\pi^+ + 3\pi^- + n\pi^0$, multipion reson. 3=2258
- $\bar{p}-p$ total cross-sects, above 10 GeV 3=4260
- production by 30 GeV protons on Al, Be, Fe 3=6090
- production cross-sections, 0.5-1 BeV 3=586
- prod., from synchrotron, alternating gradient proton separator 3=16999
- scattering, elastic, with protons, rel. to TCP theorem 3=2264

Pumps

See also Vacuum pumps.

No entries this year

Pyroelectricity

- BaTiO_3 , effect of heating 3=12929
- BeO crystals, polar character 3=10884
- CdS 3=8556
- CdSe 3=8556
- $\text{LiH}_2(\text{SeO}_4)_2$, pyroelectric constants 3=10881
- $\text{Pb}(\text{Ti,Zr})\text{O}_3$, effect of heating 3=12929
- triglycine sulphate, microwave-induced response 3=25414

Pyrometers

- automatic emissivity-compensated 3=7383
- for flames, two frequency 3=9644
- i.r., for sewing needle temp., during operation 3=14403
- light sources, secondary, tungsten strip lamp suitability 3=9643
- optical, numerical eval. of temp. 3=3914
- photoelec., detection limits 3=1859
- radiation and optical, photoelec., det. limits 3=1859
- radiation, recording, using thermistors 3=11408
- standard, high intensity, pulsed Xe source 3=24000

Quantum chemistry

- atoms, molecules and their interactions, semi and non-empirical theories 3=12745
- fluorescein, spectra, by LCAO MO method 3=2647
- macromolecules synthesis and structure 3=20035
- valence-bond structures and matrix elements for any multiplicity 3=6382

Quantum electrodynamics

- See also Electrodynamics; Electromagnetism.
 Aharonov-Bohm effect, survey 3=24582
 bound state with props. of neutral vector particle 3=10020
 Cherenkov radiation of charge in plasma 3=12436
 classical equations, regularization 3=17166
 convergent model, self-energy of electron and photon in lowest order 3=24586
 Coulomb interaction form 3=5918
 covariant quantization with photon rest mass 3=536
 Dirac equation and boson fields 3=5930
 Dirac many electron eqn. in Schrödinger—Pauli form 3=1632
 dispersion relations 3=22051
 electron Green's function, branching 3=4320
 electron-positron interactions, small distance check 3=24692
 electron scatt. by mag. field in impenetrable torus 3=19422
 e.m. field quantization 3=7765
 e.m. fields, quantum-mechanical correl. theory 3=9654
 e.m. potentials in quantum theory 3=14854
 e-e scatt., considering hard-photon radiation 3=24694
 e^+e^- annihilation in flight, lowest order calc. 3=7834
 e, μ , prop. similarities 3=17297
 in e-p scatt., new approach 3=17165
 expanding universe, general relativity 3=21085
 form factor effects on $e^+ + e^-$ reaction cross-sections 3=2250
 gauge covariant formulation 3=5915
 gauge invariance and inertial effect of photon spin 3=19599
 gauge invariance, enlarged curvature tensor 3=2185
 gauge invariance and mass in 2-dimensional model 3=24584
 gauge invariance, rel. to scatt. integration rules 3=24585
 geometrized class of Yang—Mills fields, and e.m. vector potential 3=17187
 Green's and vertex functions, asymptotic representation 3=14857
 Hamiltonian formalisms, inequivalent 3=14853
 high-energy cross-sections, soft-photon contrib. 3=24583
 Klein—Gordon difference eqn., covariant 3=12392
 Klein—Gordon operator, multi-mass, Green's distrib. and Cauchy problem 3=5916
 Lee model, ghost state elimination 3=2194
 Lorentz gauge formulation for non-Abelian fields 3=10019
 Lorentz invariant formulation, using e.m. field intensities 3=14856
 mass renormalization conditions 3=14849
 massive transverse photons 3=14855
 media with negative absorption, radiation reaction 3=14033
 mesons, vector, renormalizable 3=12391
 μ , e, prop. similarities 3=17297
 μ -meson prod. from electron collisions 3=592
 minimal e.m. coupling concept 3=4362
 non-vanishing photon mass, interaction represent. 3=7766
 particle in Coulomb field, Schrödinger eqn. 3=1576
 perturbation expansion, partial summation 3=7764
 photon Green's function, branching 3=4320
 photon statistics of radiation field 3=23992
 postulate of complete commuting set of observables 3=4318
 propagators, Schwinger equations 3=17162
 quantum generators, theory 3=14796
 radiation-gauge, asymptotic condition 3=17164
 radiation gauge, two-point function 3=12389
 Regge pole behaviour 3=22050
 Reggized photon theory 3=19574
 regularized models 3=4317
 relativistic eqn. of motion of spin 3=5914
 relativistic eqn. of motion, translational 3=5913
 rel. to Regge poles 3=17202
 scattering amplitudes, high energy 3=12390
 scattering processes, radiative corrections 3=12423
 self-consistent field theory, deriv. of Pauli exclusion principle 3=10018
 statistical light beams, semiclassical and quantum mechanical equivalence 3=16528
 two-body problem, electromag., relativistic calc. 3=23769
 vacuum expectation value of three-point function 3=7778

Quantum electrodynamics—contd

- validity limit, review 3=4358
 vector gauge field rel. to nonzero mass 3=5919
 vector meson, charged, interacting with e.m. field, theory 3=552
 vertex function, single log. approx., asymptotic value 3=24587
 vertex part, asymptotic form 3=4319

Quantum statistics.

See Statistical mechanics.

Quantum theory

- See also Electron theory; Field theory, quantum; Fundamental particles.
 action principle for higher order Lagrangians with indefinite metric 3=3752
 adiabatic theorem, approx. validity 3=14024
 annihilation operators in periodic functions space 3=14858
 causality 3=5330
 commutation relation, generalized 3=11693
 commutativity, local, lemmas 3=16521
 conserved operator eigen-states, projection technique 3=3748
 continuous representation theory, postulates 3=21230
 continuous represent. theory, rel. to classical dynamics 3=21231
 Debye—Hückel potential, energy levels 3=3746
 derivation from Nernst's theorem 3=47
 Dirac operator, spectral props. 3=21237
 double commutators, integral represent. 3=16535
 dynamical equations and angular momentum 3=5365
 dynamics, classical and quantum, unified variational formulation 3=7112
 dynamics, unified variational form, with class. 3=14027
 eigenvalue problems, new solns. 3=18731
 elementary particles, spatially extended 3=21232
 energy shifts by potential in large box 3=16533
 epistemological analysis, Bohr's and Einstein's 3=1608
 equivalence and antiequiv. of operator sets 3=11697
 exact integral relationship in qu. mechanics, appl. to variational method 3=1616
 fine structure constant, non-dimensional nature 3=16486
 Feynman integrals, summation procedure 3=7088
 Fourier transform, and space inversion, classical mech. analogy 3=3741
 functional theory of corpuscles 3=17175
 Galilei group and its representations 3=16523
 generalized oscillator operators, irreducible represent. 3=21253
 Hilbert space, new definition, renormalization 3=21233
 historical review 3=3740
 hypervirial theorems for variation functions 3=7126
 isolated particle, thermodynamics, new way of presentation 3=9354-5
 light, resource letter for teaching 3=11877
 linear operators, parameter differentiation 3=16522
 localizability of quantum mechanical systems 3=7114
 Lorentz group, homogeneous infinitesimal operators, method 3=13
 many-quantum processes in two-state system 3=14034
 measurement operator, unitary 3=5355
 measurement theory 3=2
 measurement theory, review 3=3742
 momentum eigenfunctions, orthogonality, 3=11696
 momentum operators, generalized Hermitian 3=11695
 multiple expansion, e.m. field—charged particle interact. 3=7110
 orbital ang. momentum operators 3=11689
 orbital ang. momentum, eigenvalues 3=45
 particle interaction with environment, interpretation 3=3743
 particle scatt. at aperture, for const. momentum 3=17
 periodic potential with defect, one-dim. 3=21238
 periodic square-well potential with defect 3=18727
 perturbation expansion, spectral moments calc. 3=22683
 perturbation theory using reduced set of states 3=5360
 perturbation theory, use of asymptotic wave vector 3=23764
 photon statistics of radiation field 3=23992

Quantum theory — contd

- propagator for particle in one-dim. square-well potential 3=18729
- quadratic response functions in dielects. 3=15606
- quantum mechanics, analytic props. of scatt. amplitude 3=24631
- quantum mechanical action variations, rel. to classical dynamics 3=1615
- quantum-mechanical transform. function of 1-dim. motion, inverse cube repulsive force 3=3745
- quantum mechanics, relativistic, representation of a group 3=7113
- quantum virial expansion, rel. to lifetime matrix 3=23766
- quaternionic representation of compact groups 3=7089
- quaternions, general Q covariance princ. 3=16524
- relativistic, microvariance and microcausality 3=21234
- relativistic theory of motion, internal degrees of freedom 3=21204
- role of the observer in 3=23761
- S-matrix, spatial separation of events 3=23767
- scattering, hard core due to orthogonality 3=5364
- scattering, inverse problem 3=7123
- scattering lengths and quantum defects 3=4720
- search for further generalizations of class. physics 3=1609
- semiclassical treatment 3=1618
- sequences, distrib. and spaces 3=10016
- spin and harmonic oscill. systems, relax. 3=7137
- spinning-particle dynamics, rel. to classical theory 3=23762
- symmetry definition as automorphism of τ 3=9344
- symmetry groups and ensembles, algebraic structure 3=5359
- symmetry, rel. to Wigner's represent. theorem, 3=11687
- symmetry transforms. in quantum mechanics 3=7130
- 3-j symbols, symmetry relations 3=7798
- three-particle states and Regge cuts in nonrelativistic model 3=23770
- time measurement and "minimal time" 3=21242
- time operators satisfying $[H, T] = -i\hbar$ 3=42
- two-level system coupled to loss mechanism 3=23768
- two-level system coupled to radiation field 3=3744
- uncertainty principle, entropy expression 3=14636
- uncertainty principle, new derivation 3=21229
- uncertainty reln., time-energy 3=5356
- unitary group, irreducible represent., bases 3=23731
- variational problems solns 3=18698
- vertex function, reduction formula, extension to n-point (n odd) 3=18724
- wave packet tunnelling through barrier, time 3=1611
- wave-particle duality, energy momentum interchanges 3=16520
- N-dimensional total orbital ang. momentum operator 3=18692

application methods

- amplifier noise minimum, rel. to uncertainty principle 3=5842
- amplifiers, linear, quantum noise 3=5837
- atoms, eigenfunctions, by spin operators 3=17525
- atoms, statistical model, correlation correction 3=8172
- backscatter from inhomogeneous media 3=11676
- bispinor theory rel. to spinor theory in Riemann space 3=4328
- Bloch's transport eqn., generalization 3=9366
- Boltzmann eqn., Lorentz gas perturbation theory approx. soln. 3=3772
- Born expansion, optimization 3=11699
- chain, "almost one-dimensional," correction to classical statistics 3=23773
- collisions, many-body, lifetimes 3=9351
- communication, quantum theory, need 3=5839
- creation and destruction operators, representation 3=21241
- cross-relaxation theory, in spin systems quantum statistical 3=5372
- crystal, exciton triplet gas, linear, free 3=25252
- crystals, ionic, box model 3=4796
- delta-function potential in box, particle 3=7117
- d³ configuration, spin-orbit matrices 3=2545
- DWBA and (p, 2p) ang. correl. 3=19841
- excitation of matter by monochrom. radiation 3=25085

Quantum theory — contd**application methods — contd**

- electron in one-dim. "liquid" chain, weak-binding approx. 3=9325
- elementary scatt. theory, new approach 3=7124
- e.m. potentials, role 3=14854
- energy levels of particle in screened Debye field 3=18732
- ferromagnetic films, Néel wall thickness 3=5015
- ferromagnetism, spin wave theory, review 3=15766
- fluctuations from driven state 3=9360
- γ_5 invariance 3=19546
- Hartree-Fock approx., perturb. method 3=3754
- Hellman-Feynman theorem, and perturbation theory 3=25033
- hypervirial theorems, to free systems 3=7127
- Klein paradox 3=2191
- Liouville eqn. for system in contact with a reservoir 3=69
- liquids, electron motion, with slight local order violation 3=10747
- masers, optical, phonons, quantum electronics 3=9966
- measurement, von Neumann's theorem 3=16534
- meson prod., multiple, new quantum mechanism 3=10133
- molecules, diamagnetic, Faraday effect, theory 3=6383
- molecules, g-tensor, gauge invar. theory 3=6384
- molecules, spin coupling, Heitler-London method 3=6385
- molecules, zero-point energies calc. 3=12795
- one-centre integrals of extraordinary functions 3=6339
- optical coherence 3=16725
- particles with variable mass, relativ. theory 3=4327
- perturbation theory for arbitrary times 3=14035
- perturbation theory, Nakanishi parametric representation, derivation 3=16532
- perturbation theory when several eigenstates of approx. Hamiltonian used 3=1614
- plasmas, electric microfields description 3=394
- potential barrier penetration in variable external fld 3=83
- quartic oscillator, energy levels and matrix elements 3=14030
- radiation-matter interaction, variation-perturbation approach 3=7129
- relaxation processes 3=5373
- scattered distorted waves, one-centre expansion 3=3758
- scattering, "invariant imbedding" techniques 3=11700
- scattering, variational method, integral form 3=7122
- Schrödinger equation, differentiated 3=11698
- Schrödinger eqn., radial, for Coulomb field 3=9346
- S-matrix, nonrelativistic, rotational invariance 3=10056
- solids, transport processes 3=12958
- spin relaxation, Fokker-Planck eqn. 3=1623
- steady-state processes, irreversible thermodynamics 3=64
- thermodynamics 3=18739
- three-body problems, two-body methods 3=21240
- three-particle scatt., planar, formal theory 3=13999
- Thomas-Fermi positive ions, interpolation formulae, graphical 3=7429
- three-particle system, resolvent of Schrödinger operator 3=21244
- tunnelling, from many-particle viewpoint 3=18733
- two-spin system, relaxation 3=1624
- variational method, exact integral relationship 3=1616
- Wannier functions, generalized, orbital theory 3=6452
- Wigner-Racah ang. momentum calculus, generalization 3=7121
- WKB approximation appl. to radial problems 3=18725
- WKB, to molecules diatomic, vibration bands 3=15324

many-particle systems

- See also Helium, liquid; Superconductivity; Superfluidity.
- angular momentum transport eqns. 3=7139
- antiferromagnetics, statist. mech. 3=8693
- asymptic behaviour of perturb. expansions 3=7141
- atoms, statistical theory, phase shift, determ. 3=8170
- Bogolyubov method, Tomonaga-Schwinger equation 3=1636
- Bose-Einstein gas, rotating, transition temp. 3=14067
- Bose gas, free, nonrelativ., canonical commut. relns. 3=14056
- Bose gas, ground state energy, simple calc. 3=16552
- Bose gas, interacting, exact analysis 3=14064

Quantum theory—contd

many-particle systems—contd

- Bose gas, interacting, excitation spectrum 3=14065
- Bose gas, nonideal, at nonzero temp. 3=76
- Bose, ground state in pair approx., variational calc. 3=21260
- Bose, superfluidity 3=14059
- Bose system, N-body, with finite state number 3=11724
- bosons + fermions, interacting system, energy spectra 3=14060
- boson gas, Bose-Einstein condens. order 3=18751
- boson gas, nonideal, pair Hamiltonian model 3=78
- bosons, interacting, Green functions and self-energy parts 3=11725
- bosons, interacting system, low-lying states 3=79
- bosons, point-particle, one-dim. gas 3=14057
- bosons, quantum cell model 3=5388
- bosons, rel. to ferromag. spin waves 3=13234
- broken symmetries and massless particles 3=23787
- cluster expansion of operator averages 3=23790
- collective treatment, trial wave-function 3=14066
- collision integral, correlative distrib. function 3=4354
- composite-particles system, second quantization represent. 3=21257
- condensed systems, functional method 3=14054
- creation and annihil. operators, invariant functions 3=9363
- density matrix, mono-electronic, exclusion principle appl. 3=23794
- density matrix representations 3=3762
- dielectric formulation for general interact. 3=14051
- e^+e^- , simple analytic approx. 3=10484
- electron gas, collision integral, in terms of elec. polarizability 3=5381
- electron gas, dielectric behaviour, correlation effects 3=73
- electron plasma, dielectric permeability tensor 3=402
- electron scatt., elastic, by randomly distrib. centres 3=5380
- electron tunnelling theory 3=18733
- enclosed, volume-energy dependence, sum rule 3=3764
- energy and momentum distrib. 3=9323
- energy level spacing distrib. 3=9362
- eqn. of state at ultra-high densities; relativistic limitations 3=3528
- equations, Thomas-Fermi, ion, negative, existence and solution uniqueness conditions 3=23783
- equilibrium approach, temp. and mag. reson. 3=11718
- Fermi-Dirac system, two-particle bound states 3=1629
- Fermi-Dirac systems, non-ideal, field equations 3=5377
- Fermi fluid of 2 types of particles 3=15080
- Fermi fluid, superconducting 3=23795
- Fermi fluids, Landau theory, quasi-particle assembly 3=23798
- Fermi gas, attractive, energy and scatt. length 3=23800
- Fermi gas, momentum distrib. function 3=3766
- Fermi gas, rarefied, with attraction 3=1637
- Fermi liquid, slow neutron scatt. 3=7863
- fermions, Green's functions for systems with pairing correlations 3=3767
- fermions, quasi-particle approx. 3=1638
- Fermi system, collective excitation with non-zero ang. mom. pairing 3=5383
- Fermi system, ground-state energy, and other props. 3=23796
- Fermi system, non-zero ang. momentum pair interaction, props. 3=23797
- Fermi system of hard spheres, ground state energy contributions 3=11721
- Fermi system, sing-part. Green's funct. with attractive and repulsive interaction 3=7147
- fermion liquid, theory 3=77
- Fermi particle degenerate system kinetic eqn. 3=80
- fermion density formula, one-dimensional 3=14055
- fermion pairs, boson-like behaviour 3=14061-2

Quantum theory—contd

many-particle systems—contd

- fermion system with attractive interact., two-particle approx. 3=7148
- fermion system, ground-state, Goldstone expansion, corrections 3=14063
- fermion system, nonperturbative approach 3=73
- fermion systems, interacting, t-matrix singularity 3=75
- fermion system, normal, static responses, Sampson-Seitz procedures 3=5387
- fermion system, pairing correl. theory 3=11727
- fermion system, self-bound, density propagator 3=9369
- fermion system, bound states 3=19562
- fermions, Bogolyubov eqn. 3=21263
- fermions, Yang's conjecture, proof. 3=16555
- fermions, quantum vortices 3=16556
- fluids, homogeneous, evolution eqn. 3=23792
- four-electron, generalized product functions 3=10449
- free fermions and bosons, linear response function 3=1628
- generalized master eqn., deriv. 3=71
- Green functions, analytical props. 3=3765
- Hamiltonian and other systems, asymptotic theory with nearly periodic solutions 3=11669
- Hartree-Fock approx., thermal, stability 3=7144
- Hartree-Fock approx., perturb. method 3=3754
- Hartree-Fock solutions and collective motion, stability 3=18746
- identical particles, space-time correl. function 3=5382
- independent-particle model, self-consistent field theory 3=6340
- irreversible processes, general theories, review 3=21251
- large dissipative systems, ergodicity 3=11716
- large quantized systems, perturbation theory, review 3=21256
- liquids and dense gases, polarizability change by many-body interact. 3=1705
- low temperatures, review 3=2
- many-boson, many-fermion systems, density matrices 3=18690
- many-boson systems, perturbation theory 3=3768
- many-boson systems, simple and gen. condensation 3=1635
- many-fermion system, exactly soluble model 3=23799
- many-fermion systems, degenerate problems, perturb. theory 3=9364
- many-fermion systems, nonuniform, one-particle Green's function 3=5385
- masers, radiation field, statistics 3=12356
- master eqn., with special transition probab. 3=11717
- metals, functional variational principles 3=752
- multicomponent system, binary collision method 3=5379
- n-fermion problem, 1- and 2-particle functions 3=16551
- N-particle wavefunctions, direct-product represent. 3=1610
- norm of wave functions, logarithm, linked graph expansion 3=18747
- nuclear many-body problem, translational and rotational states 3=627
- nuclear matter, effect of velocity depend. forces 3=6132
- nuclear, with nonuniform density 3=6131
- operators, mass and polarization, spectral representation, any temp. 3=23784
- paired particles, second random-phase approx. 3=12024
- parafermi rings, representation theory 3=23788
- particles which cannot exchange places 3=3763
- Pauli exclusion principle, derivation from quantum electrodynamics 3=10018
- perturbation theory calc. of partition function 3=1627
- perturbation theory for double-time Green functions 3=7142
- perturbed system, eigen-functions from Maxwell-Boltzmann density operator 3=7133
- π -mesons, four, wave-functions 3=14999
- π -mesons, three, effective ang. momentum 3=4444
- potential in large box, energy shifts 3=16533
- proper self-energy function, asympt. form 3=14049
- quantum fluids, formal sum of pairing diagrams 3=11726
- quantum gas, evolution eqn. soln. 3=9365
- quasi-particle approx., effect of no. of particles 3=23789

Quantum theory — contd**many-particle systems — contd**

- Rayleigh-Schrödinger perturb. theory, Huby's rules 3=74
- with regular but vel. depend. interact., perturbation theory 3=7967
- relativistic, complete orthonormal set of eigenstates 3=18748
- relativistic many-body problems, angular momenta 3=72
- relativistic partial-wave expansions 3=14896
- relativistic quantum mechanics, introdn. of particle posns. 3=7797
- relaxation, master eqn. deriv. 3=21255
- scattering, soluble models, complex ang. mom. 3=7125
- self-consistent field and dielec. formulations 3=14050
- single-determinant wavefunctions, spin-component analysis 3=23785
- single-fermion Green's function, analytical props. 3=1633
- single particle energies in Green's function formalism 3=14053
- spin interactions, use of linked cluster expansions 3=6698
- symmetry characteristics theory 3=12409
- symmetry prop. of relative coords. 3=12422
- system on contact with a reservoir, qu. mech. Liouville eqn. 3=69
- system of harmonic oscillators, resonant oscillatory relaxation 3=18744
- system of weakly-interacting particles, impulse excitation 3=5384
- three-body problem, soln. for rigid bodies 3=1617
- three-body problems, two-body methods 3=21240
- three-particle unitarity condition, diagrams 3=5970
- Tonk's gas, generalized, partition function 3=16550
- transport coeffs., thermal Green's functions 3=23804
- two-body interactions and Nilsson potential 3=23793
- two-body problem, electromag., relativistic calc. 3=23769
- two-particle system, relativistic 3=11674

quantization

- See also Field theory, quantum, quantization.
- canonical transformations 3=21239
- composite-particles system, second quantization represent. 3=21257
- Dirac eqn., new quantization 3=16530
- fermions, general operator, second quantiz. 3=9372
- Feynman histories, summation, Hamiltonian approach 3=3747
- gravitational field 3=3719
- harmonic oscillator, linear, damped 3=5363
- infinite-dim. invariance groups, generalized Schwinger-Feynman 3=5357
- non-linear transition theory 3=16531
- particle, spin ≤ 2 , wave equation soln. 3=10023
- and relativity general, validity of covariance 3=14007
- space-time, parametrization 3=7119
- spinor eqn., non-linear quantization 3=3749
- spinor eqns., two-component higher order 3=4322
- superconducting films, transitions, fluxoid quantiz. 3=9675
- superconductors, magnetic flux, Gorkov model 3=1896

wave equations

- accidental degeneracies, theory 3=7116
- adiabatic perturbation of discrete spectrum states 3=43
- analytic wave-functions, inclusion of correlation 3=6345
- approximate wave-functions, statistical theory of error 3=9348
- Bethe-Salpeter eqn., in nonrelativistic quantum mech. 3=41
- Bethe-Salpeter wave function, normalization 3=7813
- convection with classical mechanics 3=14026
- Coulomb Green's function, in closed form 3=18730
- Coulomb Green's function, nonrelativistic 3=11701
- Coulomb potential, Dirac and Schröd., anomalous solns. 3=16525
- Coulomb wave-functions, numerical tables 3=14924
- de Broglie theory, relativistic notation 3=16527
- Dirac, asymptotic soln. by WKB method 3=23765
- Dirac difference eqn., covariant 3=12392

Quantum theory—contd**wave equations—contd**

- Dirac eqn., initial value problem 3=16529
- Dirac eqn. with Yukawa potl., extra solns. 3=7768
- Dirac many electron eqn. in Schrödinger-Pauli form 3=1632
- Dirac, spin, gravitational effect 3=16499
- Dirac radial relativistic eqn. for particle in central field 3=21237
- electron, internal energy distrib. 1=10030
- expectation values, simple correction 3=14031
- Feynman histories, summation, Hamiltonian approach 3=3747
- Foldy-Wouthuysen transform., extension 3=5362
- for Foldy-Wouthuysen transformations 3=10065
- generalizations, non-linear, for arbitrary spin particles 3=10021
- Green's function of potl. scatt. 3=14903
- Hamiltonian, rigid asymm. rotator-type, trace formulae 3=14028
- Heisenberg-type nonlinear unifying eqns., deriv. 3=10024
- Jost functions for potl. scatt. 3=14902
- Klein-Gordon difference eqn., covariant 3=12392
- Klein-Gordon, with reversed sign for mass term 3=14022
- limits of error at arbitrary point 3=10436
- linear potl. problem, normalized eigenfunction 3=3706
- matter waves of spin 0 and 1, coupled to gravitational field 3=14025
- one-dimensional wave eqn., iterative solution 3=15317
- optimal functions for matrix element approx. calc. 3=21236
- oscillators, weakly coupled, beats 3=11694
- particle, relation of frequency to total and potential energies 3=17229
- particle, spin ≤ 2 , soln. 3=10023
- particles with spin, soln. of general eqns. in spherical coordinates 3=2230
- partitioning technique, projection operator formalism 3=44
- partitioning technique, perturb. theory, iteration 3=7115
- perturbation series, Brueckner's, simpler formula-tion 3=3753
- Picht eqn. for electron, rel. to e.m. field 3=10089
- Picht function, for scatt. at apertures 3=1582
- relativistic, Regge poles 3=12424
- relativistic, use of complex scalar fields 3=7104
- scattering problem, quasi-classical approx. 3=23763
- scattering theory using wave packets 3=3755
- Schrödinger and Dirac, boundary conditions, solns. 3=10444
- Schrödinger and Dirac, scattering phase shifts 3=18728
- Schrödinger, appl. to non-isolated systems 3=9345
- Schrödinger, bound states of central potl. 3=9347
- Schrödinger, long waves, one-dim. propag. 3=14023
- Schrödinger, for particle in Coulomb field 3=1576
- Schrödinger-Maxwell eqns. equivalence to hydro-dynamical supercond. theory 3=1612
- Schrödinger, radial, stationary phase integral method, proof 3=16526
- Schrödinger, with discrete energy spectrum, transformations 3=5358
- Schrödinger, radial, phases and amplitudes 3=9346
- simple molecules, direct soln. of Schrödinger's eqn. 3=12814
- spinor eqn., non-linear quantization 3=3749
- spinor eqns., non-linear, in twisted space 3=4332
- spins 0 and 1, Kemmer-algebra and Foldy-Wouthuysen transformations 3=14859
- square-root Klein-Gordon, relativistic invariance 3=7812
- system with many degrees of freedom 3=7118
- tensor virial theorems 3=18726
- three-particle problem, with point interaction 3=3751
- three particles of different masses, symmetry classification 3=17182
- two-component first-order, from Feynman-Gell-Mann eqns. 3=5968
- variation principle for arbitrary operators 3=10066
- variation principles for arbitrary operator 3=22093
- wave field theory, rel. to wave statistics 3=40
- wave-function of disordered system 3=9349

Quantum theory—contd
wave equations—contd

- wave-functions of quasistationary states, normaliza-
tion 3=3750
- wave geometry, 1934-44 developments 3=14017
- wave mechanics, hydrodynamic model 3=21235

Quartz

- α and β , regularity of SiO_4 tetrahedra 3=18319
- α -quartz, acoustic-mode patterns, X-ray diffraction
study 3=20087
- α -quartz, neutron irradi., Raman scatt. 3=3028
- α -quartz, with Ge impurities, colour centres, e.s.r.
study 3=22832
- α -quartz, Raman lines, elec. field effects 3=18009
- Ag ion transport, in elec. fields, in α -quartz 3=10692
- AT-cut plates, r.f. vibrations 3=21470
- acoustic generator, prod. of plane progressive wave in
water 3=16705
- addition to improve insulator thermal and dielectric
props 3=8544
- amorphous—cryst. transition, on Ag diffusion 3=13396
- amorphous, structural changes on heating in H_2 3=20917
- amethyst, synthetic, biaxial nature 3=25691
- annealing of X-ray damage 3=6555
- bars, hypersonic waves, 10^{10} c/s, excitation 3=5492
- cavities and intergranular pits 3=17776
- clocks, automatic regulation 3=7174
- colour centres, Ge-doped 3=20238
- colour centres, Ge-doped 3=20239
- coloured, synthetic, pleochroism 3=17987
- crystalline and fused, dielec. constants rel. to
temp. 3=25392
- deformation, around $\alpha = \beta$ transform. temp. 3=15990
- dielectric const. and refractive index, on fast n
irrad. 3=17929
- dielectric loss, l.f., at low temps. and imperfec-
tions 3=20157
- Diffusion of H 3=8452
- diffusion of O 3=2831
- diffusion, substitution of Ag^+ for Li^+ ions, pot. and ionic
charge 3=17788
- disks, extensional vibs. 3=5482
- dislocation obs. by etching 3=25284
- E'_2 -centres, e.s.r., theory and expt. 3=13008
- E' -centres, electron spin—lattice relax. 3=13009
- elastic constants, electric field change tensor, d.c.,
from reson. freq. changes 3=23009
- elastic and current oscillations, during Ag^+ and Cu^+
conduction 3=25412
- electromagnetic wave propag. in, harmonics, intensities
and polarizations 3=24468
- grinding of particles 3=8918
- ionic charge exchangeability, Ag^+ for Li^+ , from
pot. 3=17788
- internal friction, effect of ionizing radiation 3=23302
- internal friction meas. 3=13336
- interstitial clusters, due to neutron irradi. 3=10647
- lattice defects, rel. to neutron-irrad. 3=22765
- masers, optical phonons, quantum electronics 3=9966
- optical components of fused quartz 3=16748
- photoelectric emission, after crushing and
coloration 3=14634
- piezoelectric modes, visual observation 3=21469
- piezoelectric oscillations of slotted crystals 3=15625
- plate, AT cut, frequency spectrum 3=5481
- powders, ground, respirable size, distributed layer 3=16128
- powders, ground and shattered, X-ray diffrn. 3=3352
- radiation effects, by X-ray scatt. and diffr. 3=8473
- Raman scatt., ang. depend., 40-140° 3=20463
- resonators, transient freq. excursion 3=14764
- rose coloured, Ti colour centres 3=8459
- second harmonic generation of laser beams 3=17083
- second harmonic generation of light 3=1839
- single crystals, far i.r. absorptn. at liquid He
temps. 3=3006
- spin—lattice relaxation, rel. to neutron-irrad. 3=18136
- temp. change at boundary with superfluid He 3=5570
- thermal conductivity 3=4831
- thermoluminescence 3=11020
- vibrating, internal displacements, by X-ray diffr. 3=15982
- X-cut, sound velocity to 10 Gc/s 3=18934

Radiation

- See also Acoustic radiators; Bremsstrahlung;
Cherenkov radiation; Electromagnetic waves;
Electrons, radiation; Emissivity; Stars, radiation;
Sun, radiation; Sunlight.
- absorption and transformation of quantized
field 3=25085
- air, high-temp. equil., spectral calc. 3=1732
- atmosphere, i.r., due to nuclear explosion X-rays 3=11418
- atomic, freqn. shift in uniform field 3=1586
- black body, into space, temp. reduction 3=11403
- black-body, temporal complex coherence 3=1784
- charged particle moving in cyl. stratified media 3=16241
- cyclotron, from plasma 3=7607
- in cylind. and conical chambers 3=11993
- crystals, second harmonic generation 3=25429
- damping, relativistic charged particle 3=14744
- earth, leaving, determination 3=3437
- e.m. fields, quantum-mechanical correl. theory 3=9654
- energy transfer in cyl. and conical chambers 3=11993
- flat surfaces separated by absorbing gas 3=288
- and gas flow, magnetohydrodynamic 3=19425
- gases, as dissipative process in shock waves 3=1761
- gravitational, in first approx. to Einstein's
eqns. 3=5334
- high-energy, charged, detection possibilities 3=4368
- i.r. container for test pieces 3=11999
- incoherent, mutual coherence of 3=9574
- infrared, background discrim. criterion 3=16832
- infrared, current research papers 3=9652
- irreversibility, rel. to expansion of universe 3=16322
- Kirchoff, Stefan—Boltzmann laws restated 3=11994
- Kirchoff's law, strongly absorbing media 3=9653
- media with large horizontal variations, transfer 3=1641
- optical radiometry 3=11880
- photon statistics of arbitrary field, full quantum
theory 3=23992
- Planck function for terrestrial temps. 3=18511
- Planck's law in $h-c-1$ theories, generalizations 3=3918
- Planck's law restated 3=11995
- plasma, classical, rel. to conservation eqns. 3=12102
- plasma, Kirchhoff's law, theory 3=391
- plasma, laser, emission and pumping, review 3=22007
- plasma, local thermal equil., validity 3=19233
- plasma, mag. compressed, vacuum u.v. 3=7505
- plasma phase oscill., Cherenkov-like 3=16962
- plasma, radiative transfer of Doppler-broadened
resonance lines 3=9813
- plasma, transfer, without thermal equil. 3=14562
- plasmas, non-Maxwellian, microwave emission 3=5657
- quantum mechanical description 3=12747
- radiance-coeff. profile of optically thin radiating
medium 3=24004
- radiative transfer, algebra of resolving fluxes 3=18760
- radiative transfer eqn., appl. to scatt. in turbid
medium, 3=14368
- radiative transfer, in nonstationary state
medium 3=82
- Raman, moving charge in medium 3=24058
- reaction, classical theories, review 3=17163
- self-excitation of metal coated, plane-parallel crystalline
layer 3=23031
- shock waves, e.m. driven, radiative attenuation 3=1758
- before shock-wave emergence, intensity 3=21480
- source, use of thermal arc plasma 3=10447
- spectral distribution, use of frequency and log
scales 3=24098
- specularly reflecting plates, heat transfer 3=7381
- transfer, numerical approximations, rel. to astro-
physics 3=21266
- transfer in homog. sphere with central source 3=19061
- two-level quantum system, coupling 3=3744
- vacuum u.v. radiation physics, conference 3=5515
- H_2 - O_2 flame, emission and absorpt. meas. 3=5162
- N, atomic ions in recombination 3=7443
- W, spectral power distrib. from colour temp. 3=7322
- heat
- atmosphere i.r. flux, upward, observed and
computed 3=13678
- black bodies cooling, 5 radiator stages 3=14412

Radiation—contd
heat—contd

- blackbody, coherence-time, effective bandwidth 3=14411
- black body, from cylinder with reflecting walls 3=14409
- black body, into space, cooling, impossibility 3=19060
- differential methods of study 3=21608
- emission by diffuse conical cavities 3=14410
- finite grey atmosphere 3=21267
- flames, i.r., by extrapolation from lab. meas. 3=11992
- gas-fired panel, intensity distrib. 3=11991
- gas heating by radiation 3=1855
- gas—radiation, matter—radiation energy exchange 3=14429
- heat transfer bibliography 3=7364
- heat transfer for conduction and radiation 3=24081
- heating of body by radiant heat 3=24099
- image furnace radiant power control 3=9646
- laws, expression, use of "radiance" 3=1865
- metal, rel. to surface roughness 3=7385
- non-equilibrium propag. in opaque cold gas 3=7382
- in ocean, energy variations 3=9010
- optically black emitters, configuration problems 3=287
- "radiant exposure" as term in radiometric nomenclature 3=11990
- radiators, thermal, temp. distrib. meas. 3=11998
- sky, clear, i.r. distrib. 3=3465
- sublimation, vacuum, heat exchange nature 3=16841
- temperature image of i.r. system, theory 3=1864
- U surfaces polished and oxidized 3=14413

Radiation belts

See Atmosphere, radiation belts.

Radiation chemistry

See Chemical effects of radiations, ionizing radiations;
Radiochemistry.

Radiation detectors

See also Bolometers; Photometry; Radioactivity measurement.

- actinometric devices, temp. and press. depend. 3=21609
- astronomical, far i.r., for planetary obs. 3=16349
- of black radiation, in form of 10° cone 3=14414
- filters, i.r., analysis 3=19011
- gases, i.r. bands, integr. intensity and line widths, meas. method 3=7248
- hemispherical source in contact with an infinite Lambert information capacity 3=11909
- information capacity, internal and radiation noise 3=3922
- infrared, current research papers 3=9652
- i.r., Cs oxide cathodes, fatigue effects 3=2018
- i.r. evaporation technique, oil film evap. suppression 3=24104
- i.r., Golay pneumatic detector 3=24103
- i.r., liquid nitrogen Dewar attachment 3=24102
- i.r., semiconductor, comparative study 3=291
- i.r., using thermal effects, standardization 3=3920
- laser radiation, using photoelec. device, noise 3=1870
- lenses, i.r., in contact with detectors 3=16736
- Lyman- α , by photoionization, CS₂ and bromethane 3=14416
- mm and sub-mm, by free-carrier absorpt. in semicond. 3=25385
- mean square error, lower bound eval. 3=1580
- measurement of absorpt. and refl. 3=16789
- photocell, for u.v., portable transistorized instrument 3=21536
- photodetectors, u.v. description 3=7337
- radiometer, absolute differential 3=24106
- radiometer, absolute, using transient temp. rise of Cu block 3=14415
- radiometer, infrared integrating 3=7384
- radiometer, net, for optimum sensitivity 3=290
- selective receivers, energy meas., optical wavelengths 3=21535
- sensitivity of radio and optical receivers, comparison 3=3921
- solar short-wave radiation, photocathodes 3=9150
- u.v., extreme, using planar analyser and electron multiplier 3=14631
- u.v., fluorescent type 3=18974
- u.v., middle and vac., spectrally selective 3=14306
- vidicon, i.r., with PbS photocond. films 3=11996
- wide-angle receiver, radiant intensity distrib. 3=24105

Radiation effects

See Biological effects of radiations; Chemical effects of radiations; Physical effects of radiations.

Radiation monitoring

See also Dosimetry.

- aspects in nuclear energy, encyclopaedia 3=4285
- gases, specific activity, using gas-flow chambers 3=4583
- inhalation of Rn from air, absorbed dose 3=5285
- in-pole oxalic acid dosimeter 3=22453
- sound indicator for intensity, improved circuit 3=2169
- whole body, A.E.E. Winfirth 3=17118

Radiation pressure

See also Acoustic streaming.

- acoustic, independent of sound speed 3=18924
- elastic wave generation, by pulsing in solids, and radiation beam study 3=18889
- evaporation pressure in a radiation beam 3=19062
- forces between two spheres in plane sound field 3=1766
- on gaseous cloud due to resonance line 3=16328
- interstellar dust and star formation 3=3536
- solar, on satellites, artificial non-spherical, orbital effects 3=23715
- torsion balance meas. 3=18940

Radiation protection

See also Radiation monitoring.

- aspects in nuclear energy, encyclopaedia 3=4285
- concrete shielding const. 3=17516
- DFR reactor, safety assessment 3=2540
- DIDO, shielding calcs. 3=2515
- electron accelerator shielding 3=455
- flux meas. in shielding foils 3=19912
- γ -ray shielding, back-scatter from concrete 3=10077
- γ -transport problems, spherical harmonics technique 3=12736
- handbook 3=2146
- heavy-water pressure tube reactor, shielding 3=19903
- Monte Carlo shielding calcs., importance sampling 3=22456
- radiography, radioactive inert gas, as soft γ source, for minimum health hazard 3=12280
- shielding calc., hydrogen-free "removal cross-section" method 3=17515
- shielding damage due to fast neutrons, determ. by dosimeter 3=10423
- shielding materials for neutrons and γ -rays 3=2539
- of space vehicles, mag. shields 3=21139
- X-ray apparatus, installation to avoid direct radn. hazards 3=462
- Al, Al + Fe, Pb, plexiglass, polyethylene, shielding meas., and "removal cross-section" method 3=17515
- Co⁶⁰ source, cold-encapsulation 3=22315
- U-fission products, absorpt. by humic acids 3=22439

Radioactive dating

- counter, proportional, for weak β -rays 3=7829
- using mica, particle track visualization, fission 3=5907
- proportional counters for radiocarbon dating 3=6949
- rocks and meteorites, rel. to cosmology theories 3=7017
- tectonic, age estim. using Pb isotopes 3=7024
- C¹⁴ in benzene form, liquid scint. counter 3=12615
- C¹⁴ dating, proportional counter system, low-background 3=24538
- C¹⁴, expt. results at Gdańsk, Poland 3=1420
- C¹⁴ procedure, apparatus 3=11382
- U fission, particle tracks in mica 3=6948
- by U²³⁴/U²³⁸ ratio, Pleistocene era 3=13647
- by Xe, meteorites, history 3=11525

Radioactive tracers

- aerosols, small particle size, separation 3=1401
- for atmosphere, movements, Cu⁶⁴O 3=18503
- for atmosphere movements, produced by cosmic rays 3=9022
- catalytic tritium labelling for organics 3=19800
- desorption energy meas. of Ag from Mo and Ni 3=23521
- for diffusion in solids, meas., volatile impurity 3=20216
- flow meas. of open currents 3=1669
- metallurgy, Czech, use in 3=6874
- Ci³⁸, radio tracer study of anodic film composition 3=25830
- Kr⁸⁵, gas flow meas. by total count method. 3=155
- Rn²²² and Xe¹³³ in crystals, thermal release 3=823

Radioactive tracers—contd

³⁵S, radio tracer study of anodic film composition 3=25830

Radioactivity

See also Alpha-, Beta-, Gamma-rays; Atmosphere, radioactivity; Beta-decay theory; Chemical analysis, radioactive; Chemical effects of radiations, ionizing radiations; Fallout; Geophysical prospecting; Nuclear decay theory; Nuclear excitation; Nuclear reactions; Radiochemistry.

α -activity, from Tl, Bi, Pb bombarded by C ions 3=12644
 α -decay, fine structure of nuclear masses 3=6194
 α -decay, semiclassical approx. 3=22319
angular distribution analysis, corp. with expt. 3=24880
beta-decay total energies, isobaric analysis 3=17426
 β -emitters identification, absorpt. meas. 3=12607
for density meas., sensitivity and accuracy 3=9396
directional-correl. data, variances 3=19804
earth, effect on shape under rotation and gravity 3=16188
even-even nuclei, α -decay 3=12616
fluorite, rel. to colour centres 3=8458
 γ -cascades, summing spectra 3=14944
 γ -sources, effective use of radiation 3=2396
magnetic dipole transitions, in even-even nuclei, with collective excitations 3=4585
nuclear spectroscopy conference, Jan.-Feb. 1961 3=4286
radionuclide power generators 3=12063
rainwater, natural 3=23590
source, Ag, Co, Cu 3=24532
source prep. e.m. separation method 3=12608
for thickness meas., sensitivity and accuracy 3=9396
B¹⁰, 5.11 and 5.16 MeV levels 3=24860
Be⁷, in atmosphere above Atlantic Ocean 3=1454
Bi²¹⁴, (RaC), γ -ray spectra 3=8054
Br⁸⁰, delayed-neutron emission 3=12625
Cd^{115m}, negatron decay, γ -rays 3=24899
Co⁶⁰ polarized in Fe-Co alloy, β -ray anisotropy 3=4590
Co⁶⁰ + Se⁶⁶ liquid source 3=22328
Cr⁵⁵, β -decay energy 3=22329
He⁸, β -decay, energy spectrum 3=10183
I¹²⁵, K-LL Auger spectra, satellites 3=4707
I¹³⁰-Te¹³⁰ decay energy 3=22336
Ir¹⁹⁴, relative intensities of γ -lines 3=12602
Li⁸, β - α ang. correl. 3=12619
Li⁸, "hammer" stars in emulsion 3=22325
Lu¹⁷⁸, 3.7 hr isomeric state 3=8010
Mo⁹⁶, ang. correl. meas. 3=4591
N¹⁶, γ -radiation from excited states 3=24862
Nb⁹⁴-Zr⁹⁴ decay energy 3=12627
Ne¹⁹, 1st and 2nd excited levels 3=15102
Os, neutron-deficient isotopes 3=10273
Pa²³³ \rightarrow U²³³ decay, effect on nuclear reactors 3=6332
Pm¹⁸¹, internal conversion electron spectra 3=12634
Pu + Be source, neutron spectrum 3=15159
Rb⁸⁵ daughter, rel. to characteristics of diode containing Kr⁸⁵ 3=24335
Rn, equilibrium with decay products in atmosphere 3=21042
Sm¹⁵⁰, β and γ -spectra 3=12635
Te¹²³-Sb¹²³ decay energy 3=22336
Te¹²⁵, K-LL Auger spectra, satellites 3=4707
Th, α track, abnormally long, from star 3=22321
Th, in emulsion, abnormally long α tracks 3=22320
V⁵³, β -decay energy 3=22329
Y⁹⁰, β -emission, energy and bremsstrahlung 3=12626
Y⁹¹, β -decay, e- ν ang. correl. 3=8036
Zr⁹⁰-Nb⁹⁰ decay energy 3=12627

artificial production

See also Nuclear reactions.

basic reactions, kinetics and technology 3=642
in reactor, Ti and Fe sample containers 3=19905
Ag^{110m}, from neutron irradiation of Ag¹⁰⁹ 3=22401

dating.

See Radioactive dating.

decay periods

α -emitters, short, meas. by ionization spectrometer 3=8023
even-even nuclei, first excited states 3=24871
even nuclei, 150 < A < 190, first excited 2⁺ states 3=8003

Radioactivity—contd

decay periods—contd

lifetimes, short, meas. with background, statistical estimation 3=24669
light nuclei, theoretical and exper. results 3=19808
meas., from Doppler-broadened resonance fluorescence line 3=629
second order half-life precise measuring equipment 3=645
spontaneously fissioning isotope, in U²³⁸ reaction with B¹¹, O¹⁶, Ne^{20,22} 3=24984
tables for correcting for radioactive decay, 27 nuclides 3=15135
transition rates, rel. to pair correlations 3=19802
unknown fission prod. of U²³⁸-Ne²² react. 3=6316
Ag¹¹⁰, meas. 3=2403
Ag¹¹² 3=650
Ag¹¹² 3=24867
Al²⁸, first excited state 3=12585
Al²⁸, 450 keV level 3=22296
Al²⁸, 418 keV level 3=22296
Al^{28*}, ft value 3=6200
Al²⁸, meas. 3=2403
Am²⁴¹, spontaneous fission half-life 3=4675
As⁷³, excited states, γ -decay 3=19781
At²¹² 3=2419
Au¹⁹⁸ 3=12628
B¹¹, 2.14/excited state 3=15171
B¹², β -emission 3=15139
Ba^{131m} 3=8001
Be⁹, γ -ray lifetimes, calc. 3=2437
Be¹⁰, 3.37 MeV level lifetime 3=10251-2
Bi²¹¹, 404 and 830 keV levels 3=10315
Br⁷⁸, β^+ and γ -decay 3=2407
Br⁸³ 3=19817
C¹², γ -ray lifetimes, calc. 3=2437
C¹³, 7.66 MeV state 3=12581
C^{12,13} in stars, (5 to 100) \times 10⁹ K 3=3588
Ca⁴⁷, mixing ratio, and strong interactions, time-reversal invariance 3=24893
Cd¹¹⁴, 4⁺ (1282 keV) level lifetime 3=15149
Ce¹⁴⁰, 2.083 MeV two-proton level 3=12560
Cl³⁸ 3=6198
Cm²⁴⁴, 1042 keV state 3=22314
Cm²⁴⁷, α half-life, lower limit 3=19825
Co⁶⁰ 3=22338
Co^{60m} 3=17432
Cs^{134,137}, by mass spectrometry 3=22337
Cs¹³⁷, mass spectrometric det. 3=12631
Cs¹³⁷ 3=22338
Cu⁶³, 961-keV level 3=14938
Cu^{63,65}, excited by 36 MeV N¹⁴; α ions 3=10260
Dy¹⁶² 3=2413
Dy¹⁶⁰, first excited state 3=24871
Dy¹⁶⁰, 86.5, 283, 966 keV levels 3=15121
Dy^{160,162}, 2+ and 4+ states 3=10267
Dy¹⁶⁵, ground state 3=655
Er¹⁵⁹ 3=4597
Er¹⁶⁴, first excited state 3=24871
Er¹⁶⁶ 3=12639
Er¹⁶⁶, first excited state 3=24871
Er^{166,168}, 2+ and 4+ states 3=10267
Eu¹⁴⁵⁻⁷ 3=8005
Eu¹⁴⁷, 625 keV state 3=10300
Eu¹⁴⁹, 496 keV level 3=10301
Eu¹⁵⁰ 3=2413
Eu¹⁵⁰ 3=19822
Eu¹⁵¹, 21.7 keV state 3=17416
F^{17*} 3=19745
F¹⁸, low-lying levels 3=17402
F¹⁹, first excited state 3=22294
F²⁰ 3=8030
F²⁰, meas. 3=2403
F²¹ 3=12621
Fe⁵⁶, 0.845 MeV level 3=22303
Gd¹⁴⁶⁻⁷ 3=8005
Gd¹⁵⁴, rotational level lifetimes 3=10266
Ge⁷¹, isomeric γ -decay 3=15134
 Λ He⁴, in emulsion 3=10233
 Λ He⁵, in emulsion 3=10233

Radioactivity—contd

decay periods—contd

He⁸, β -decay 3=614
 He⁸, meas. 3=2403
 Hf isotopes 3=8051
 Hf¹⁷⁷, first excited state, lifetime 3=6178
 Hf¹⁷⁷, 113 and 321 keV levels 3=15121
 Hf¹⁷⁷, 133 keV level 3=12568
 Hf⁷⁹, 217 keV excited level 3=19792
 Hf¹⁸⁰, 2+ and 4+ states 3=10267
 Hg¹⁹⁶, first excited state 3=24871
 Hg¹⁹⁸, 412 keV level 3=19796
 Hg¹⁹⁸ 3=12642
 Ho¹⁵⁵ 3=8048
 I¹²⁷ source for half-life expts. 3=12630
 I¹²⁹, first excited state 3=2367
 I¹²⁹, first excited state 3=19787
 I¹²⁹, 26.8 keV level, by delayed coincidence 3=12594
 In¹²² 3=4593
 Ir¹⁸⁰, γ from Au + p, 660 MeV 3=24912
 Ir^{187m, 189m} 3=24911
 Ir¹⁹¹, 129 keV level, delayed coinc. meas. 3=2394
 Ir¹⁹¹, 129.6 keV level 3=15121
 Ir^{192, 192m2} 3=12628
 Ir¹⁹⁴, isomeric transition, 47 sec 3=2393
 K⁴² 3=6198
 Kr⁷⁶ 3=15144
 Kr⁸³, low-energy M1 transitions 3=6172
 La¹²⁴⁻¹²⁸ 3=8040
 La¹²⁷⁻¹³¹ 3=22339
 La¹³⁷, low energy M1 transitions 3=6172
 La¹³⁹, lowest level 3=4573
 Li⁷, first excited state 3=4370
 Li⁷, first excited state, mean lifetime 3=4564
 Lu¹⁷⁸, 114 and 396 keV levels 3=15121
 Lu^{178, 177}, first excited state, lifetime 3=6178
 Lu¹⁷⁹ 3=10311
 Mg²⁵, first excited state 3=12585
 N¹², β -emission 3=15139
 N^{14, 15} in stars, (5 to 100) $\times 10^6$ °K 3=3588
 N¹⁴, meas. 3=2403
 Na²⁵, first excited state 3=15103
 Na²³, first excited state, mean lifetime 3=4564
 Na²⁴ 3=6198
 Nb⁹⁰, isomeric γ -decay 3=15134
 Nb⁹⁴, isomeric state 3=17484
 Nd¹³⁹ 3=10303
 Ne²⁰, 7.02 MeV level 3=6165
 Ni⁶⁰, 2.50 MeV 4+ state 3=10267
 Ni⁶⁵ 3=17434
 Np²³⁷, spontaneous fission half-life 3=4676
 Np²³⁹, 74.6 keV level 3=10277
 O¹⁴, unitary symmetry model 3=22062
 O^{16, 17} in stars, (5 to 100) $\times 10^6$ °K 3=3588
 O¹⁸, low-lying levels 3=17402
 O¹⁹, meas. 3=2403
 Os¹⁸⁸, 2+ state 3=4555
 Os^{190m} 3=10273
 Pa²³⁴, half-lives 3=2395
 Pd¹⁰⁵, 319 keV state 3=6169
 Pm¹⁴¹, isomeric γ -decay 3=15134
 Pm¹⁴⁵, lowest level 3=4573
 Pm¹⁴⁷, 91 keV level 3=4576
 Pm¹⁵³ 3=4595
 Po isotopes 3=10316
 Po²⁰⁷, 69 keV first excited state 3=19798
 Po²¹⁰, 1431 and 1478 keV levels 3=6183
 Pr¹⁴³, 57 keV first excited state 3=4575
 Pt¹⁹⁰ 3=4602
 Re¹⁸⁴ from e+, e- conversion spectra, from W + d, 13.6 MeV 3=24910
 Re^{185, 187}, first excited states 3=19794
 Re¹⁸⁷, 206 keV state 3=24839
 Re¹⁸⁷, 686 keV 3=4580
 Re¹⁸⁸ 3=6209
 Rh^{104, 104m} 3=10360
 Rh¹¹⁰, γ -decay 3=24894
 Ru¹⁰² first excited state 3=24871
 Sb¹²¹, 70 keV level, by delayed coincidence 3=17413
 Sb¹²³, first excited state 3=12593

Radioactivity—contd

decay periods—contd

Sc⁴⁷, mixing ratio, and strong interactions, time-reversal invariance 3=24893
 Sc^{50m}, γ -decay 3=24894
 Se⁷⁶, 0.559 MeV level, lifetime 3=10262
 Se^{77m}, meas. 3=2403
 Sm¹⁴³, isomeric state 3=6174
 Sm¹⁴⁷, 121, 198 keV levels, from coincidences 3=19788
 Sn^{113m} 3=10291
 Sn¹¹⁸, 1.27 MeV level, self-absorpt. meas. 3=17412
 Sn¹¹⁷, first excited state 3=12593
 Ta isotopes, neutron deficient 3=8051
 Ta¹⁸¹, 619 keV level 3=17420
 Tb isotopes, n deficient 3=10302
 Tb^{148, 150, 152}, β^+ 3=10303
 Tb¹⁵⁷ 3=22341
 Tb¹⁵⁹, 58 keV state 3=12597
 Tb¹⁶⁰, 364 keV level 3=4577
 Tc¹⁰⁰ 3=10360
 Te^{119m} 3=15151
 Te¹²¹, 214 keV level, 1 nanosec. upper limit 3=22306
 Te^{121, 123}, first excited state 3=12593
 Te¹²⁵, 35.5 keV level 3=6145
 Tl²⁰⁴ 3=12628
 Tl²⁰⁷, 351 keV level 3=10315
 Tm¹⁶², from β^+ conversion 3=22345
 U²³⁴, isomeric state 3=22313
 W¹⁸⁰, first excited state 3=24871
 W¹⁸², 152 keV transition 3=657
 W¹⁸³, 67.7, 100, 222 keV transitions 3=10272
 Xe¹²⁶, first excited state 3=24871
 Y⁸⁸, isomeric γ -decay 3=15134
 Yb¹⁸², from β^+ conversion 3=22345
 Yb¹⁸⁶ 3=10310
 Yb¹⁷², half-lives of 1174, 78.7 keV excited states 3=8009
 Yb¹⁷³, 79 keV state 3=12597
 Yb¹⁷³, 351 keV level 3=4577
 Yb¹⁷³, 351, 637 keV levels 3=8008
 Zn⁷² 3=24896
 Zr^{90m} 3=17432

decay schemes
 ang. correls., mag. dipole and elec. quadrupole interact effects 3=12614
 coincidence, complicated spectra, evaluation 3=24881
 14 short-lived nuclides 3=19809
 isobars with A = 129 3=15153
 K⁻ mesic atoms 3=17546
 odd A > 230 nuclei, α -decay mass, fine structure 3=8026
 proton decay, double, ang. and energy correl. 3=10281
 Ac²²⁵, α -decay 3=17446
 Ag¹⁰⁸ 3=15215
 Ag¹¹⁰ 3=6206
 Ag^{110m} \rightarrow Cd¹¹⁰ β -transition 3=8038
 Ag^{110m} to Cd¹¹⁰, conversion electrons 3=24898
 Ag¹¹² 3=650
 Al²⁴, β decay, circular polarization 3=17428
 Al²⁸, γ coincidences, and Mg²⁶ levels 3=22295
 Am²⁴¹, α -decay 3=2421
 Am²⁴¹, α -decay 3=15162
 Am²⁴³, α - γ ang. correl. rel. to mag. fld. 3=6211
 Ar⁴¹, β^- decay, K ion electron shake-off 3=19854
 As⁷⁰ 3=12624
 As⁷³, excited states, γ -decay 3=19781
 At²¹² 3=15157
 Au¹⁹⁸ 3=10274
 Au¹⁹⁸, β -decay, β - γ correl. electron vel. 3=6204
 Au¹⁹⁹, β -ray spectra 3=2418
 Au¹⁹⁹, to Hg¹⁹⁹, mag. moment of Hg¹⁹⁹ 158 keV level 3=658
 Au¹⁹⁹, K and L-shell coeffs. 3=12643
 B¹¹, 3=6277
 B¹² \rightarrow 3He⁴ + π^- 3=7975
 B¹² and N¹² \rightarrow C¹², β -ray spectra, test of conserved vector current theory 3=15137
 B¹³ 3=10284-5
 Ba¹³³, by γ - γ ang. correl. 3=17440
 Ba¹³³, by e capture, and Cs¹³³ level spins 3=19820
 Ba¹³⁴ 3=15114

Radioactivity—contd

decay schemes—contd

- Ba¹⁴⁰, and γ -ray spectra 3=8039
 Be⁸, p- α branching ratio meas. 3=10250
 Br⁷⁵, β^+ and γ -spectra 3=2407
 Br⁸³ 3=19817
 Ca⁴⁷, β - γ ang. correl., rel. to time reversal 3=10033
 Cd¹¹⁰, γ -cascades, directional correlations 3=15148
 Cd¹¹⁵, 2.3 day 3=17437
 Cd^{115m} 3=7999
 Cd^{115m} 3=17438
 Ce¹²⁹ \rightarrow La¹²⁹ \rightarrow Ba¹²⁹ \rightarrow Xe¹²⁹ 3=15153
 Ce¹⁴³, 33 hr 3=10297
 Ce¹⁴⁴ 3=10296
 Ce¹⁴⁴, number of photons per decay 3=8041
 Cf²⁴⁰, α -decay 3=19826
 Cf²⁴⁰, alpha decay, preferential polar emission rel. to temp. 3=4608
 Cm²⁴², α -decay superfluid effects 3=19805
 Cm²⁴⁴, 1042 keV state 3=22314
 Co⁵⁸, β - γ coincidences 3=6192
 Co⁵⁷ 3=17431
 Co⁵⁸ 3=649
 Co⁶⁰, β -decay, β - γ correl. with electron velocity 3=6204
 Cr⁵¹, γ -ray spectra 3=22330
 Cr⁵¹, 750 keV state 3=10258
 Cs fraction, from U proton fission 3=24995
 Cs¹³² 3=10295
 Cs¹³⁴ 3=24903
 Cs¹³⁴, by γ - γ ang. correl. 3=17440
 Cu⁶⁰, K fluorescence coeff. 3=7993
 Dy¹⁵³ 3=17443
 Dy¹⁵³, ¹⁵⁵, ¹⁵⁷ from conversion electron coincidences 3=8047
 Dy¹⁵⁵, positron spectrum 3=19823
 Dy¹⁵⁷, to levels in Tb¹⁵⁷ 3=22342
 Dy¹⁶⁵ 3=10306
 Dy¹⁶⁵, ground state 3=655
 E²⁵³, alpha decay, preferential polar emission rel. to temp. 3=4608
 Er¹⁵⁸ \rightarrow Ho¹⁵⁸ \rightarrow Dy¹⁵⁸ 3=10308
 Er¹⁵⁹ \rightarrow Ho¹⁵⁹ \rightarrow Dy¹⁵⁹ 3=4597
 Er¹⁶⁰, ¹⁶¹, ¹⁶⁸ \rightarrow Ho¹⁶⁰, ¹⁶¹, ¹⁶⁸ \rightarrow Dy¹⁶⁰, ¹⁶¹, ¹⁶⁸ 3=10307
 Er¹⁶¹ \rightarrow Ho¹⁶¹ 3=10308
 Eu isotopes, neutron deficient, α -activity 3=2413
 Eu¹⁴⁶ from γ 's 3=8044
 Eu¹⁴⁶, γ -decay 3=12595
 Eu¹⁴⁶, γ - γ directional corrls. 3=24905
 Eu¹⁴⁷ 3=10298
 Eu¹⁴⁸ 3=15117
 Eu¹⁴⁹ 3=8045
 Eu¹⁵⁰ 3=19822
 Eu^{152m} 3=15085
 Eu¹⁵², E2 K conversion coeffs. 3=2411
 Eu¹⁵⁶, number of photons per decay 3=8041
 Eu¹⁵⁶, beta decay 3=10299
 F²⁰, β -decay, β - γ correl. 3=6203
 F²¹, β^- decay 3=12621
 Fe⁵⁶, 1st excited state 3=17407
 Fe⁵⁹ 3=648
 Ga⁷¹, K fluorescence coeff. 3=7993
 Gd isotopes, neutron deficient, α -activity 3=2413
 Gd¹⁴⁷ 3=10300
 Gd¹⁴⁹ 3=10301
 Gd¹⁵¹ electron capture 3=24906
 Gd¹⁵², β - γ ang. correl. 3=17417
 Gd¹⁵⁸, and Tb¹⁵⁹ levels 3=22340
 Ge⁷¹, isomeric γ -decay 3=15134
 H⁸ 3=12620
 He⁶, electron loss after β^- decay 3=10182
 He⁶, π^+ mesonic decay 3=19757
 He⁶ \rightarrow π^+ + H³ + n 3=7976
 He⁵, non-mesonic 3=6146
 He⁶ \rightarrow Li⁶ + β^- , from B¹¹ (γ , 3p)He⁶ ? , 320 MeV 3=15136
 Hg, neutron deficient isotopes 3=659
 Hg¹⁹² 3=22350
 Hg²⁰³, beta decay, rel. to conversion electron transverse polarization 3=4603
 Hg²⁰³, β -decay 3=10314

Radioactivity—contd

decay schemes—contd

- Ho¹⁶⁰ \rightarrow Dy¹⁶⁰, from conversion electron coincidences 3=15154
 Ho¹⁶⁸, γ ang. correl., differential, 1380-81 keV cascade, statistical perturbation effects 3=22343
 Ho¹⁶⁸, internal conversion, 94 keV transition, penetration effects 3=6176
 I¹³¹ 3=10294
 I¹³¹ 3=15152
 I¹³², internal conversion 3=22335
 I¹³², internal conversion studies 3=2409
 In¹⁰⁷, positron emission and electron capture 3=19819
 In¹⁰⁸, removal of In¹¹⁰ contamination effects 3=15150
 In¹¹⁴, internal conversion, double, 192 keV transition 3=6176
 In¹¹⁴ polarized, β -decay, asymmetry, in alloy with Fe 3=2417
 In^{114m}, two-quantum decay 3=2388
 Ir¹⁸⁹, 15.8 hr 3=10313
 Ir¹⁹², β -decay, matrix elements 3=12645
 Ir¹⁹² polarized, β -decay, asymmetry, in alloy with Fe 3=2417
 Ir¹⁹⁴, isomeric transition, 47 sec 3=2393
 La¹⁴⁰, β -decay, nuclear matrix elements 3=6207
 Li, muonic decay 3=19757
 Li⁹ \rightarrow Be⁹ + β^- , from B¹¹(γ , 2p)Li⁹, 320 MeV 3=15136
 Lu¹⁷⁵, internal conversion, 114 keV transition, penetration effects 3=6176
 Lu¹⁷⁹ 3=10311
 Mg²⁷ 3=2405
 Mg²⁷ 3=6199
 Mg²⁷, from MgO + d, 9 MeV, γ - γ coincidence, absence of 0.84-0.81 MeV or 0.84-1.01 MeV cascades 3=24892
 Mn⁵¹, β - γ coincidences 3=6192
 Mn⁵⁵, K fluorescence coeff. 3=7993
 Mn⁵⁶, from β , γ spectra and coincidences 3=8032
 Mn⁵⁶, β -decay, β - γ correl. 3=6203
 Mo⁹⁹, and γ -ray number 3=8037
 N¹² 3=10284-5
 N¹² and B¹² \rightarrow C¹², β -ray spectra, test of conserved vector current theory 3=15137
 N¹⁴, 5.83 MeV state 3=17401
 N¹⁴, 10.22 MeV level 3=17399
 Na²⁴, β decay, circular polarization 3=17428
 Nb⁹⁰, isomeric γ -decay 3=15134
 Nb⁹⁴, ^{94m} 3=6168
 Nb⁹⁶ 3=22305
 Nd¹⁴¹ 3=17441
 Nd¹⁴⁴ 3=12633
 Ni⁵⁶ 3=15143
 Ni⁵⁷, by scintillation techniques 3=2386
 Ni⁶⁰ 3=17434
 Ni⁶⁵, β - γ coincidences 3=6192
 Np²³⁷ 3=4605
 O¹⁴, Coulomb effects and β -decay matrix element 3=647
 O¹⁶, intermediate, in C¹²(α , 4c) reaction 3=4671
 Os¹⁹¹, ^{191m} 3=10312
 P³², β -decay, deviations from allowed form 3=6201
 P³², slow electrons due to ionization 3=10286
 Pa²³¹, α -decay, fine structure 3=2420
 Pa²³² 3=4581
 Pa²³², β -decay 3=12604
 Pa²³³, beta-decay 3=10318
 Pa²³⁴ 3=2395
 Pa²³⁴, 1.14 min isomer UX₂ 3=15153
 Pa²³⁴(UX₂), internal conversion coeffs., L, 63, 29 keV 3=7998
 Pb, neutron deficient isotopes 3=659
 Pb²⁰⁰ 3=6210
 Pb²¹¹, β^- emission 3=10315
 Pm¹⁴¹, isomeric γ -decay 3=15134
 Pm¹⁴⁸, β -decay matrix elements 3=8043
 Pm¹⁴⁸ \rightarrow Sm¹⁴⁸ 3=19821
 Pm¹⁴⁸, ^{148m}, β -decay 3=15116
 Pm¹⁶¹, from energy and coincidence meas. 3=8042
 Pm¹⁶³ 3=4595
 Po¹⁹⁹, ²⁰⁰, ²⁰¹, ²⁰³, α -decay to electron capture ratio 3=24914
 Po²⁰⁰, ²⁰¹, ²⁰³, α -decay to electron capture ratios 3=10316

Radioactivity—contd

decay schemes—contd

- Pr¹⁴³, 57 keV first excited state 3=4575
 Pr¹⁴⁴, β -decay 3=12632
 Pr¹⁴⁴, β - γ correlation 3=2410
 Pr¹⁴⁴, and γ -ray number 3=8039
 Pr¹⁴⁴, ground state, ρ decay, ρ - γ directional correl., energy depend. 3=19753
 Pt, α -decay 3=4602
 Pt isotopes, α decay 3=17444
 Pt isotopes, short-lived 3=8052
 Pt, neutron deficient isotopes 3=659
 Pt¹⁸⁸ 3=8016
 Pt¹⁹⁷ 3=24913
 Pt¹⁹⁹, and Au¹⁹⁹ low levels 3=17422
 Pu²³⁸, α -decay superfluid effects 3=19805
 Pu²³⁹, α -decay 3=4606
 Pu²³⁹, fine structure of α -groups 3=10319
 Pu²³⁹ \rightarrow U²³⁵ 3=15160
 RaE, β -decay, shell model invest. 3=8055
 Rb⁸⁴ \rightarrow Kr⁸⁴, β decay, calc. 3=17435
 Rb⁸⁴, β , 1st-forbidden β -decays 3=22331
 Rb⁸⁶ \rightarrow Sr⁸⁶, β decay, calc. 3=17435
 Re¹⁸⁴ 3=10271
 Re¹⁸⁴, from e⁺, e⁻ conversion spectra, from W + d, 13.6 MeV 3=24910
 Re¹⁸⁸ polarized, β -decay, asymmetry, in alloy with Fe 3=2417
 Re¹⁸⁷, γ - γ ang. correls. 3=22348
 Re¹⁸⁸, γ - γ coincidence 3=6209
 Rh⁹⁷, β - and γ -ray spectra 3=2408
 Rh^{104m}, 4.4 min. isomer, gamma-decay 3=4569
 Rh¹¹⁰, γ -decay, 5.5 MeV 3=24894
 Ru⁹⁵, β - and γ -activity suggested new scheme 3=19818
 S³², excited, γ decay, from P³¹(p, γ)S³² 3=22377
 Sb^{122a} 3=10264
 Sb¹²⁴, β - γ directional correl. 3=24901
 Sc⁴², β decay to Ca⁴², anomaly 3=22301
 Sc^{42m} 3=10257
 Sc⁴³, β^+ , by coincidence 3=17471
 Sc^{44,44n} 3=12623
 Sc⁴⁶, β - γ circ. polarization correl. 3=15142
 Sc⁴⁶, β - γ circ. polarization correl. 3=22328
 Sc⁴⁸ 3=10288
 Sc^{48,50,50m} 3=12622
 Sc⁵⁰ 3=7992
 Sc⁵⁰ 3=10287
 Sc^{50m}, 258 KeV γ -ray 3=24894
 Se^{61m,61} 3=2406
 Se⁸³, β - γ coincidences 3=6192
 Si²⁸ 3=19811
 Sn isotopes, β -transitions, theory rel. to exptl. ft values 3=6196
 Ta¹⁷⁶ 3=15155
 Ta¹⁷⁶, γ -rays following decay 3=24909
 Ta¹⁸², γ -decay 3=12601
 Ta¹⁸² \rightarrow W¹⁸², γ - γ directional correlation 3=4599
 Tb¹⁵¹ 3=10305
 Tb¹⁶⁰, β -decay 3=19790
 Tb¹⁶⁰, Dy¹⁶⁰ 3=12599
 Tc⁹⁴, 293 min. 3=15145
 Tc⁹⁸ 3=22305
 Te, neutron deficient isotopes 3=659
 Te¹¹⁷ 3=24902
 Te¹¹⁹ isomers 3=15151
 Te¹²¹, positron decay 3=10293
 Th²³⁴, 24 day 3=15158
 Ti⁴⁵, γ -ray search 3=17429
 Ti⁴⁸ 3=10344
 Ti⁴⁷, 160 keV level, positron decay, search for 3=12587
 Tl, neutron deficient isotopes 3=659
 Tl¹⁹⁹, to Hg¹⁹⁹, mag. moment of Hg¹⁹⁹ 158 keV level 3=658
 Tl²⁰⁷, β -branch to p_{1/2} level in Pb²⁰⁷ 3=17445
 Tm¹⁶², β^+ conversion spectrum 3=22345
 Tm¹⁶⁶ 3=10309
 Tm¹⁶⁶ \rightarrow Er¹⁶⁶ 3=8049
 U²³⁴, α -decay superfluid effect 3=19805
 U²³⁴, isomeric state 3=22313

Radioactivity—contd

decay schemes—contd

- V⁴⁷, β - γ coincidences 3=6192
 V⁴⁸ 3=19812
 V⁵¹, K fluorescence coeff. 3=7993
 V⁵⁸, 305 keV state 3=10258
 W isotopes, short lived 3=8052
 Xe¹³¹ 3=6171
 Y⁸⁸, isomeric γ -decay 3=15134
 Y⁸⁸, positron decay 3=6205
 Yb¹⁶², β^+ conversion spectrum 3=22345
 Yb¹⁶² \rightarrow Tm¹⁶² \rightarrow Er¹⁶², from Ta + p (660 MeV) 3=22345
 Yb¹⁶⁸ 3=10310
 Yb¹⁶⁸ \rightarrow Tm¹⁶⁸, γ 's 3=24908
 Yb¹⁶⁹ \rightarrow Tm¹⁶⁹ 3=12640
 Yb¹⁶⁹, and Tm¹⁶⁹ levels 3=22346
 Zn⁶⁹, β -ray spectra 3=2418
 Zn⁷² 3=8035
 Zn⁷² 3=24896
 Zr⁹⁷ \rightarrow Nb⁹⁷ \rightarrow Mo⁹⁷, γ -ray spectra 3=17436
- electron capture**
 atomic overlap and electron exchange effects 3=10283
 L/K capture ratios, exchange effects 3=15131
 M/L ratios, effect of electron exchange, theory 3=22324
 standardization of radionuclides, source self-absorpt. 3=10278
 Ag¹⁰⁸, population of Pd¹⁰⁸ 3=17410
 Ag¹¹⁰, K-electrons, upper limit 3=22333
 Ar³⁷ 3=8033
 Ar³⁷, 1S orbital electrons, γ -spectrum 3=4589
 Ar³⁷, L to K ratio, exchange effects 3=10283
 Ba¹³³ decay, and Cd¹³³ level spins 3=19820
 Be⁷, from continuum orbits in stars, nuclear matrix elements 3=2404
 Co^{57,68}, L/K ratio 3=19813
 Co⁵⁸, K-capture, effects on nuc. alignment 3=17433
 Cr⁵¹ 3=8033
 Dy¹⁵⁵, K/ ρ^+ ratio 3=19823
 Dy¹⁵⁹, decay to Tb¹⁵⁹ 3=2414
 Er¹⁶⁵, meas. 3=2415
 Er¹⁶⁵-Ho¹⁶⁵, exptl. matrix element 3=12639
- Eu¹⁴⁶, 4.7 day 3=4596
 Eu¹⁵⁰, electron capture branching 3=2413
 Fe⁵⁵ 3=8033
 Fe⁵⁵, atomic electron ejection, energy spectrum 3=24895
 Fe⁵⁶, L/K ratio 3=19813
 Gd¹⁵¹, γ and γ - γ coinc. spectroscopy 3=24906
 Gd¹⁵³ 3=654
 Ge⁷¹ 3=8033
 Kr⁷⁸ 3=15144
 Mn⁵⁴ 3=8033
 Mn⁵⁴, L/K ratio 3=19813
 Ni⁵⁸, K-capture interference, decay through virtual state 3=19816
 Ni⁵⁹, virtual, γ -ray spectrum data 3=8034
 Pb²⁰⁰ 3=6210
 Po^{199,200,201,203}, ratio to α decay 3=24914
 Sc⁴⁴ 3=12623
 Tc⁹⁴, 293 min 3=15145
 Tl¹⁹⁹, branching ratios 3=658
 V⁴⁸, L/K capture ratio 3=15131
 Yb¹⁶⁶, K-capture probability 3=10310
 Yb¹⁶⁹, K α X-ray of Tm¹⁶⁹, isomeric shift 3=12640
 Zn⁶⁵, L/K capture ratio 3=15131
- protection.**
 See Radiation protection.
- Radioactivity measurement**
 See also Dosimetry; Radiation monitoring; and the specific radiation, e.g. Gamma-rays.
 anticoincidence counting for standard materials 3=643
 atmospheric, simple method 3=16231
 γ - γ coincidence method, dead-time correction 3=4584
 coincidence techniques, survey 3=9706
 curie, definition, rel. to natural materials 3=641
 γ -ray logging, normal to interface bet. media 3=23576
 γ -ray spectrometry of airborne fission product radioactivity 3=5206

Radioactivity measurement — contd

- γ -testing of minerals, effect of nonuniform distrib. 3=2397
- gas flow meas. by total count method, 3=155
- lifetimes, delayed coincidence meas., analysis 3=2384
- of moon's surface 3=21145
- natural β -activity, hourly meas. 3=15124
- radio-isotopes with complex decay schemes 3=15123
- rainfall and dust, separate sampling 3=3476
- radon daughter products, hourly meas. 3=15124
- scintillation scan data, magnetic tape recording 3=21147
- short half-lives, h.f. deflection method 3=12606
- tables for correcting for radioactive decay, 27 nuclides 3=15135
- thoron daughter products, hourly meas. 3=15124
- Au¹⁹⁸ solution, β specific, absolute 3=22349
- Be⁸, ground-state, detection method 3=22269
- C¹⁴, using liquid scintill. method 3=8022
- Ra in soln., microdosage using nuclear emulsion 3=4582
- Sn¹¹⁰, 1.27 MeV level, resonant self-absorpt. 3=17412
- T, using liquid scintill. method 3=8022

apparatus

See also Particle detectors.

- alpha gauge, for small density meas. 3=3781
- counter arrangement for weak activities 3=4288
- counter, Geiger, H, externally quenched, for tritium 3=644
- γ -spectrometer, 2-channel, for wells 3=23577
- gases, specific activity, using gas-flow chambers 3=4583
- heavy-ion detection system 3=12609
- irradiated soln., rapid handling system 3=24885
- large samples, 2 π scintill. counter 3=6186
- microcalorimeter, adiabatic 3=6188
- nuclear lifetimes to 10⁻¹¹ sec, methods 3=12605
- recoil product separation by elec. field, appl. to Br(n, γ) and I(n, γ) 3=8110
- sample containers of Ti and Fe 3=19905
- scintillation counter, liquid, for C¹⁴-labelled cpds. activity meas. 3=5901
- source prodn. by cathode sputtering 3=19801
- spectrometer, automatic single-channel 3=15126
- sum-coincidence spectrometer, stabilization 3=5979
- transistorized fast coincidence circuit 3=5614
- 20 sources, simultaneous positron detection 3=12610
- vacuum deposition of radioactive materials 3=15125
- CO₂ sampler, high-volume, atmospheric 3=13690
- Co⁶⁰ source, cold-encapsulation 3=22315

Radioastronomy

See also Cosmic radiations, radiofrequency; Sun, radiation, radiofrequency.

- aerial meas., 36 m telescope, 53-67 cm 3=25976
- aerials, grating response correction 3=9256
- amplifier, parametric for 21 cm H line meas. 3=7044
- amplifier parametric, 1370 Mc/s, test 3=18649
- amplifiers, low-noise, usefulness 3=5840
- atmospheric refraction errors, correction 3=9948
- aurora, radar echoes at 488, 944 Mc/s 3=21068
- Cassiopeia, 45 Mc/s, study of ionospheric drifts 3=3493
- Centaurus A, central component polarization 3=7052
- cosmological models, background criterion 3=9157
- danger from increasing man-made interference 3=3615
- declination meas. of radio sources 3=23702
- frequencies protection 3=11586
- galactic radio emission, 1.5-10 Mc/s, -42° declination 3=9281
- galaxies, external, as radio sources 3=5283
- Galaxy, anti-centre, 21cm, and Lindblad's dispersion orbits 3=13928
- galaxy M82, interference at 1420 Mc/s 3=3627
- interferometer, tracking, three base-line 3=18648
- interferometer for very-long baseline use 3=3616
- interstellar clouds, mag. fields meas. 3=5282
- Jodrell Bank research, phys. basis 3=11587
- Jupiter, decametric, cause 3=18658
- Jupiter, decametric emission 3=18655
- Jupiter, polarized decimeter radn., source 3=3620
- Jupiter, polarization and mag. pole orientation 3=18656
- Jupiter, and radiation belts 3=21130-1
- Jupiter, three sources 3=18654
- meteor, echoes, Brysk analysis, criticism 3=16427

Radioastronomy—contd

- meteor echos, 300 Mc/s, interpretation 3=13925
- meteor echoes, wind vel. meas. 3=11520
- meteor radar echoes, 1961 results 3=9273
- meteor scattering echo, over-dense ionization column 3=16428
- meteor signal reflections, decay rates 3=13924
- meteor trails, scatt., Eshleman's model modification 3=23709
- meteor trails, scattering of radio waves 3=7049
- meteors, luminosity and ionization obs. 3=5252
- molecules, diatomic, spectra, meas., by paramag. reson. absorption 3=19988
- moon, radar reflections at 425 Mc/s 3=11596
- moon, scattering behaviour, at 3.6, 68, 784 cms wavelength 3=11598
- moon, Tycho crater, radar reflectivity enhancement 3=9267
- multi-element arrays for precise positions meas. 3=9274
- multiplicative arrays 3=9261
- noise obs. using satellites, use of Z-mode propag. 3=1537
- non-thermal sources, spectra rel. to brightness temp. 3=1541
- novae outbursts, cause 3=3586
- pencil-beam system, 4.5 min. arc 3=9276
- planet, Jupiter, dynamic, repeatability 3=18657
- planet Jupiter, mag. moment, from polarization, correction 3=18613
- planets, conference, Liège (1962) 3=13862
- planets, microwave radiation, as research tool 3=18599
- planets, review 3=18652
- polarization, linear, search, 21 cm 3=18660
- radar astronomy, ruby maser use 3=5894
- radiometers, noise generator for calibration 3=24162
- receiver, L-band, travelling wave tube 3=7045
- receivers, linearity meas., simple 3=13918
- satellite-borne aerials, effective area 3=23703
- solar bursts, very intense, at 10-25 Mc/s 3=3619
- solar, conference 3=13916
- solar flares, rel. to X-ray emission 3=3579
- spectral sensitivity functions, formula 3=5269
- spectrometer for 21cm 3=16430
- star scintillation rel. to ionospheric diffraction 3=11427
- star scintillation rel. to ionospheric zenith angle 3=11426
- stars, red dwarf, flares and 240 Mc/s emission 3=18659
- sun, continuum bursts 25-70 000 Mc/s 3=3617
- telescope, paraboloidal, steerable in azimuth 3=9260
- telescopes, for extragalactic surveys, design 3=7042-3
- tracking technique, high resolution obs. 3=9257
- Venus, brightness distrib. 3=16426
- Venus, 4 mm emission 3=3622
- Venus, high surface temp., explanation 3=21129
- Venus, radar obs. 440 Mc/s 3=11594
- Venus, reflections, astron. unit determ. 3=9272
- Venus, rotation, period and direction 3=11518
- Venus, temp. 3=16358
- Venus, temp., enhancements 3=21127-8
- Venus, 3 cm, effect of solar illum. phase 3=18653
- Young, sources, nonthermal emission, spectra, non-stationarity 3=3614
- SH spectra, meas. by paramag. reson. absorption 3=19988

Radiochemistry

See also Chemical analysis, radioactive; Chemical effects of radiations; Radioactive tracers.

- fluoro-organic cpds., F¹⁹(n, 2n)F¹⁸, F¹⁸ retention 3=5171
- gas phase reactions of hot atomic F 3=21005
- irradiated soln., rapid handling system 3=24885
- neutron-activation study of GaAs contamination by quartz 3=1274
- solids, chemical damage due to radiation 3=2841
- Ag, colloidal, γ recoil products from neutrons, separation 3=6929
- As in Zn, Gutzwiller method of detm. 3=1399
- Br^{80m} decay in Co, Rh and Ir pentamminebromo complexes 3=23553
- CH₃I¹²⁵ and C₂H₅I¹²⁵ decay, formation of fragment ions 3=18459
- P; contamination by As, Mn, Ga, neutron activation detm. 3=1398

Radiochemistry — contd

- T in Li salts, n irradi., and thermal release 3=23552
 Zr⁹⁷, ions, hot, from U fission, exchange with
 ZrCl₄ 3=21006

Radiography

- See also Luminescent devices; X-ray tubes.
 of Armco iron, shock-loaded 3=9549
 autoradiography of defects in worked steel 3=5143
 electron microscopy, autoradiog. 3=16439
 emulsion autoradiograms, quantitative,
 possibilities 3=17158
 low-voltage technique for metals 3=2073
 neutron radiography technique 3=16475
 radioactive inert gas, as soft γ source, for minimum
 health hazard 3=12280
 X-ray, of radioactive specimens 3=7668
 X-ray absorpt. coeffs., quantitative det. 3=21198
¹²⁵I low-energy γ -source 3=21150

Radiometer gauges

See Vacuum gauges.

Radiowave propagation

See Electromagnetic wave propagation.

Radiowave spectra

See Nuclear magnetic resonance and relaxation;
 Paramagnetic resonance and relaxation; Spectra,
 radiofrequency.

Radium

- Ra A atoms in atmosphere 3=9056

Radon

- atmospheric content. 3=25900
 atmospheric and diffusion of continental and oceanic
 masses, low altitude 3=21034
 concn. above Atlantic, effect of weather 3=9052
 daughters, in atmospheric aerosols. 3=25910
 decay product equilibrium in atmosphere 3=21042
 Rn^{220,222}, atmospheric vertical distrib. and decay
 products. 3=25899
 Rn²²² ion range, by analysis of α -line shapes 3=14677
 Rn²²² ions, 2-450 keV, range in Al, W. 3=14676

Rain

- See also Condensation; Snow.
 artificial prod. in clouds 3=13676
 and atmospheric electricity, pot. gradient, lower
 troposphere 3=18513
 and atmospheric electricity, pot. gradient, Poona,
 IGY 3=18514
 cloud formation, pptn., review 3=1439
 convective showers, drops size meas. rel. to model 3=5201
 daily, singularities, statistical value 3=3460
 drop size, radio obs., 3 cm 3=18508
 drop sizes, rel. to condensation nucleus concn. 3=18507
 drops, coalescence, allowing for condensation 3=16217
 drops, evaporation 3=9040
 drops, size distribution, var. during fall 3=13672
 fallout, altitude distrib. 3=9053
 fallout, at Sydney, from 1962 Christmas Island
 tests 3=15128
 heavy drops, theory 3=11388
 and ice nucleus concn., lunar influence 3=11399
 intensity peaks correl. with meteor activity 3=6958
 noise, acoustic, heavy 3=21503
 radioactivity, natural 3=23590
 rainbow, primary, caustic locus 3=9577
 raindrop-size distrib. with height. 3=25883
 raindrops, size distrib. 3=1435
 rainfall rate, radar meas. 3=13669
 thermometer, thermistor 3=13656
 tropical, continuous, quiet, electricity, origin 3=13671
 wind meas. using radar Doppler shift 3=1433
 Be⁷, and Cs¹³⁷, var. 3=25904
 D and O¹⁸ content. 3=25897
 T, fallout, var., and Sr⁹⁰. 3=25896

Raman spectra

- See also Luminescence.
 crystal impurity centres 3=20464
 crystals, ang. depend., quartz 3=20463
 crystals, cubic, scattering matrix 3=23059
 crystals, diamond and zincblende, theory 3=23061
 crystals, expt. and theoretical progress 3=937
 crystals, first-order Raman effect, theory 3=25448

Raman spectra—contd

- crystals, piezoelectric tetragonal 3=3025
 crystals, polarizability theory approx. 3=20462
 crystals, rel. to e.m. wave quantization 3=2703
 crystals, resonance scattering 3=3024
 depolarization rel. to exciting light frequency 3=16765
 depolarization, rel. to polarized irradi. beam 3=732
 gases, broadening by dipole and quadrupole forces 3=9508
 glassy polyphosphate (thermally dehydrated H₃PO₄
 and (NH₄)₂H₂PO₄) 3=15695
 illumination geometry, rel. to intensities and
 depolarization 3=7332
 impact line broadening from anisotropic intermol.
 forces 3=8226
 light source, high intensity electrodeless arcs 3=7350
 line shape, and molecular vibr. and rot. 3=19963
 liquids, line width rel. to depolarization coeff. 3=15329
 medium-pressure gases, optical cells 3=24034
 molecular analysis 3=17553
 molecules, Fermi resonance obs., intermol.
 effects 3=10487
 molecules, overtones of intramol. vibr. 3=10486
 orange, red regions, excit. by He lamp 3=1821
 piezoelectric crystals, depolarization rel. to
 scattering angle 3=15693
 radiation of moving charge in medium 3=24058
 Raman phonon scatt. in spin-lattice relax. 3=25562
 scattering, stimulated, from lattice vibs. 3=23060
 scattering, stimulated, gain theory 3=14374
 7 compounds, rel. to intermolec H bond vibrations 3=25152
 solids, Hg vapour lamp, for exciting 3=5524
 source, use of ruby laser 3=7347
 spectrometer for recording 3=24033
 spectroscopy, advances and appl. 3=5517
 stimulated Raman effect 3=14373
 Cl cpds. with 2 or more oxygen ligands 3=12838
 P cpds. with 2 or more oxygen ligands 3=12838
 XY₄ mols., tetrahedral, fundamental bands of
 species F₂ 3=22586
- inorganic substances**
 crystals, electronic transitions, possibility of
 observation 3=8588
 crystals, freq. shift and broadening, temp. var. 3=10922
 glasses, phosphate, two and three-component 3=8602
 α -quartz, neutron irradi. 3=3026
 α -quartz, elec. field effects 3=18009
 quartz, ang. depend., 40-140° 3=20463
 Rochelle salt, H bond, para-ferroelectric transition
 mechanism 3=20484
 selenious acid, molten, detection of
 H₂SeO₅ 3=137
 spodumene, crystallization 3=5086
 sulphates, anhydrous, comparison, and crystal
 forces 3=13186
 thiocyanate complexes, i. r. 3=3012
 from Van de Graaff beam passed through foil and imaged
 on Raman spectrograph 3=19918
 AlBr₃, solid and liq., meas. 3=8591
 AlCl₃ in SnCl₄, 0.11-0.73 mole per mole 3=14170
 AlCl₃, solid and liq., meas. 3=8591
 BaF₂ 3=23065
 BaTiO₄ 3=17995
 BeCl₂, aq. soln., rel. to polymerization 3=9463
 BeF₂, aq. soln., rel. to polymerization 3=9463
 CBr₄, crystalline state 3=15677
 CCl₄, Raman lines depolarization 3=732
 CF₄, $\nu_1(a_1)$ modes, vibrational intensities 3=22559
 CHCl₃, CDCl₃, intensities 3=20006
 CO, line broadening rel. to collision diameters 3=7247
 CO, line broadening rel. to collision diameters 3=7247
 CsBr, Raman scatt. meas. 3=15692
 GaBr, soln., study of GaBr⁺ ion 3=5444
 Ge₂H₆ and Ge₂D₆ 3=2627
 H bond, in Rochelle salt, para-ferroelectric transition
 mechanism 3=20484
 H₂, Q₁ branch, high-resolution obs. 3=24034
 Hg halides, trichloro- and tetrachloromercurate ions in
 molten salts 3=9461
 Hg halides, HgCl₂, HgBr₂, and HgBrCl, molten
 state 3=9460

Raman spectra—contd

inorganic substances—contd

- HgI₂, rel. to force consts. and vibr. freqn. 3=6402
- In sulphate, nitrate and perchlorate aqueous solns. 3=7211
- KNO₃, fused, splitting of Raman frequencies 3=4761
- LiNO₃, fused, splitting of Raman frequencies 3=4761
- N₂F₄ vibr., and two molecular forms 3=22569
- NaI, 2537A meas. 3=25465
- NaNO₃, fused, splitting of Raman frequencies 3=4761
- PrCl₃, electronic Raman effect 3=15694
- ReF₆, rotl. 3=2623
- SF₆, $\nu_1(a_1)$ modes, vibrational intensities 3=22559
- SOCl₂, AlCl₃ and SOCl₂·2AlCl₃ complexes 3=14170
- SeF₆, $\nu_1(a_1)$ modes, vibrational intensities 3=22559
- SiF₄, $\nu_1(a_1)$ modes, vibrational intensities 3=22559
- SnBr₄, crystalline state 3=15696
- SnCl₄, crystalline state 3=15696
- TeF₆, $\nu_1(a_1)$ modes, vibrational intensities 3=22559
- TiCl₄, crystalline state 3=15696
- XeOF₄, rel. to Xe—O bond 3=17590

organic substances

- alcohols, ten, depolarization meas. 3=22579
- alcohols, ten, solvent effects on intensities 3=25115
- alcohols, twelve, characteristic bands 3=22578
- aromatic hydrocarbon molecules, effect of adsorption 3=8932
- binary solutions, molec. scatt. power, conc. depend. 3=21372
- chloroform, effects of change of state 3=731
- conjugated mols., effect of free electrons of nitrogen 3=20004
- crystalline powders, compared with solutions 3=6650
- ethane-d₄, rel. to config. and dims. 3=4765
- formic acid, effects of change of state 3=731
- methane, line broadening at 15-250 atm. 3=176
- methane and methane-d₄, $\nu_1(a_1)$ modes 3=22559
- methane, ν_3 band, rotational structure 3=22586
- methyl alcohol, effects of change of state 3=731
- naphthalene, fluoresc. spectrum, 2°-100°K 3=25493
- polyatomic mols., intensity of scatt. lines 3=11797
- polyethylene, vibrational 3=10556
- polyethylenes 3=8321
- stimulated emission, liquids, ring compounds 3=5445
- tricyanomethanide ion 3=6407
- BF₃, diethyl ether 3=15361
- BF₃, tetrahydrofuran 3=15361
- CH group, intensity, var. with excitation freq., 5461-3021A 3=25117
- C₂H₂, line broadening rel. to collision diameters 3=7247

Random functions

See Random processes.

Random processes

See also Brownian movement; Fluctuations; Statistical analysis.

- eigenvalues of random matrix 3=5368
- gas, ultrarelativistic, adiabatic one-dim. motions 3=7236
- linear systems, new treatment 3=14040
- moments of output of linear systems 3=14038
- noise, intensity fluctuations, in N-dim. space 3=11706
- percolation, band and site problems, two dimensional 3=11734
- self-avoiding walks in d-dimensional space 3=18745
- spin relaxation, Fokker—Planck eqn. 3=1623
- stochastic linear systems, Gaussian parameter variations 3=14039
- two-spin system, relaxation, theory 3=1624

Range of particles

See Particle range.

Rare-earth metals

See also the individual metals.

- atoms, Auger electron groups, K, relative intensities 3=10468
- divalent ions, fluoresc. selection rules 3=13204
- electrical resistance, theory, rel. to mag. transitions 3=13032
- energy gaps due to screw-type spin ordering 3=15465
- Fermi surfaces and spin structures in heavy metals 3=22687
- ferromag. ordering; anisotropy energy rel. to screw struct. 3=975

Rare earth metals — contd

- ferromag. spiral spin-configs., anisotropy effects 3=974
- 4f shells, indirect interactions 3=3076
- heavy, magnetic ordering, theory 3=973
- hyperfine interaction constants and magnetism 3=15954
- internal field gradients, ionic contrib., calc. 3=742
- ions, exchange polarization and magnetic behaviour 3=977
- ions, 14A apart in non-defect structure, props. 3=13205
- ions, hyperfine interactions and nuclear magnetic moments 3=22607
- ions, maser action in crystals 3=12350
- ions, relaxation in ferrimag. resonance of iron garnets 3=15925
- ions, spectroscopy, for laser appl. 3=7330
- ions, structure of fⁿ configuration 3=15292
- magnetic neutron diffraction investig. 3=1107
- magnetic order 3=8380
- n.m.r., in crystals, Bloch equations for effective spin 3=20667
- nuclei, rotation- γ - vibration interaction 3=2381
- positron mean life, meas. 3=17695
- resistance and spin disorder 3=10715
- spectra, 1st and 2nd, presence in solar spectrum 3=19946
- spectrochemical analysis, arc, atlas. 3=25854
- spin-wave spectra, energy gaps 3=25525
- thermal expansion, giant coeffs., 1.5-14°K 3=15442
- virtual bound state model 3=2756

Rare-earth compounds

See also the compounds of the individual metals; Ferrites.

- alloys, nuc. mag. relaxation, 3 mechanisms 3=18155
- arsenates, phase transformation pressure rel. to ionic radii 3=18225
- binary alloys with Au and Ag, structure 3=18336
- chelates in vinylic hosts, fluorescent props. 3=4990
- chelates, luminescence, compared with hydrated chlorides, 90, 300°K 3=11001
- chlorides, hydrated, luminescence, compared with chelates, 90, 300°K 3=11001
- crystal elec. field, effects on rare-earth ions 3=10569
- ethylsulphates, spin-lattice relaxation data 3=25579
- ferrites, ortho, single crystals, mag. anisotropy consts. 3=8683
- ferromagnetic properties of 24 cpds. 3=11038
- ferromagnetic, superconductivity, u.h. field 3=3964
- gallates, susceptibility, 300-1500°K 3=6693
- garnet ferrites, magnetic viscosity, fast component, rel. to mag. fld. and temp. 3=18102
- garnets, ferrimagnetic properties, theory 3=13281
- garnets, rare earth ion e.s.r. lines 3=15937
- garnets, spin arrangement investigation 3=11099
- with group V anions, mag. structures 3=20609
- halides, heats of fusion and transition 3=19065
- hexaborides, thermal conductivities 3=25210
- hexaborides, thermal expansion and melting point 3=20113
- hexaborides, X-ray spectra and elec. props. analysis 3=10763
- iron garnets, crystal chemistry 3=3282
- iron garnets, far i.r. spectra and ferrimag. resonance 3=8597
- iron garnets, mag. moments of ions 3=6725
- monoselenides, electronic structure 3=20131
- monosulphides, electronic structure 3=20131
- monosulphides and nitrides, elec. and mag. props. 3=20343
- monotellurides, electronic structure 3=20131
- n.m.r. rel. to cond. electron polarization 3=1202
- 1 : 1 oxytungstates, luminescence and other phys. props. 3=23105
- organometallic, as laser materials 3=9980
- oxides, crystal structure, neutron diffrn. 3=5105
- paramagnetic susceptibility rel. to temperature 3=13231
- phosphides, mag. ordering rel. to crystal fields 3=20051
- rare-earth iron garnets, Fe⁵⁷ n.m.r. 3=3196
- rare-earth Fe garnets, Fe⁵⁷ n.m.r. 3=23260
- semiconductors, ferro- and antiferromagnetic interactions 3=20565
- solids, shielding and crystal fields at rare-earth ions 3=6453
- spin-lattice relax., field depend. calc. 3=18144

Rare-earth compounds—contd

- trivalent ions in dilute salts, hyperfine structure from e.s.r. 3=1179
- tungstates, luminescence and other phys. props. 3=23105
- vanadates, phase transformation pressure rel. to ionic radii 3=18225
- B¹¹ nuclear mag. resonance 3=1197
- Cu₂, crystal structure, atomic 3=20874
- Fe garnets, mag. behaviour 3=20620
- Pr³⁺ spectrum in rare-earth trichlorides, anion effects 3=13181
- RAI₂-type structrs, mag. spin moments, ferromag. coupling 3=991
- XNi₂ (X = lanthanide), magnetic props. of Laves phases 3=15746

Reaction kinetics

- See also Catalysis; Chemical reactions; Exchanges, chemical; Explosions.
- acetylene decomposition flame, deduction from "global" flame kinetics 3=25827
- activation energies distrib. for kinetic phenomena 3=8947
- active N flame, CN band spectrum 3=8253
- anils, thermochromy, time consts. 3=20979
- atmosphere, subionspheric. 3=25872
- bimolecular exchange reactions, Monte Carlo calculations 3=25811
- butene-2, cis-trans isomerism, benzene-photosensitized 3=25828
- in combustion chambers, relaxation oscillations 3=1389
- cyclopropane decomposition 3=16158
- dissociating gas, perturbation by catalytic probes 3=18430
- equilibrium attainment, mass spectr. meas. 3=3379
- flow of gases over reactive surface 3=21423
- Frank-Condon principle appl. to electron transfer in aqueous soln. 3=8943
- gas-phase photochem. reactions, Slater's new approach 3=11357
- hydrolysis of KCN, ultrasonic meas. of rate 3=8952
- isobutyl radicals, thermal reactions 3=3390
- isomerization of isobutyl radicals 3=8942
- long chain molecules 3=5157
- long chain molecules 3=25817
- metal-gas reactions, with particulate product growth 3=18431
- multiple zone reactions, first- or second-order kinetics, conditions 3=25810
- n.m.r. study, effect of fluctuating fields 3=15379
- nitrosohydroxylaminesulphonate ion, decomposition, acid catalysed 3=20980
- O-atom reactions with olefins 3=11341
- organic iodides, pyrolysis 3=16157
- oxidation, gas, 1-100 msec. by adiabatic compression 3=20981
- oxides, oxygen pressure series of chem. potentials 3=3391
- polymers, effects of neighbouring groups 3=8949-51
- precipitation, quasi-periodic; in interdiffusion of two subs. 3=8957
- primary intramolecular kinetic isotope effect in nonequilibrium system 3=11347
- pyrolysis of cyclopropane and cyclobutane, isotope effects 3=8961
- rate theory, transmission coefficient 3=6909
- reactant isolation, one-dimensional systems 3=8946
- use of reflected shock waves 3=13594
- relaxations, meas., temperature jump appar. 3=5158
- rotating anharmonic diatomic mols., unimol. rate theory 3=6907
- small systems 3=8964
- statistical mechanics and ion decomposition reactions and stability 3=19375
- steady-state unimolecular processes in multilevel systems 3=13596
- symmetry number and reaction rates 3=18429
- thermal, along dislocations 3=8958
- thermokinetic potential, rel. to stable steady state 3=1878
- and turbulence, in pipe, mass transfer 3=14103
- unimolecular, anharmonic effects 3=10489
- unimolecular decomp. of chem. activated propyl radicals 3=20993

Reaction kinetics — contd

- unimolecular reactions, chemical theories, comparison 3=16153
- unimolecular reactions, for vibr. excitation 3=3386
- CaO = Ca(g) + O₂, by mass spectr. 3=3379
- CdSe, impurity incorporation 3=13590
- Co-Pd oxidation, anomaly at Co Curie point 3=20982
- H atom catalysed gas-phase recombination at high tempn. 3=16165
- H-atom recombination, ionic catalysis 3=16164
- HI addition to isobutene and vinyl chloride 3=11338
- FI, gas phase addition to ethylene 3=6915
- HI gas-phase reaction with CH₃I 3=11339
- HI with ethyl iodide 3=20978
- K-NH₃ soln., decomposition, e.p.r. study 3=3381
- Si crystal growth from SiCl₄ decompos. 3=13423
- UO₂, hydrofluorination, optical interference meas. 3=24043

Recombination

See Ions, recombination; Semiconductors.

Recording

See also Sound recording.

No entries this year

Rectifiers

See also Electron tubes; Semiconducting devices, diodes and junctions.

- metal-semicond. contact, Schottky barrier meas. 3=10847
- phthalocyanines 3=17916
- sandwiches, Se-Tl₂Se and Se-InSe boundary diffusion 3=25293

Reflection

See also Neutrons, reflection; X-ray reflection.

- phase-shift data taken through transparent window, interpretation 3=9599
- plasma, hydromag. waves 3=483
- plastic wave, from obstacle, theory 3=23968
- Sommerfeld-Runge law in 3 and 4 dimensions 3=21

acoustic waves

See also Echo; Reverberation.

- echoes, from solid sphere in water. 3=211
- by irregular bodies, summation formula 3=9560
- low-loss acoustic cavity 3=7287
- metals, at low temp., maximum at critical angle theory 3=8355
- normal modes, at end of closed waveguide 3=14266
- by ocean surface, focusing effects 3=11385
- at open end of circular tube, reflection coeff. formula 3=16710
- parabolic, amplification factor off optical axis 3=14267
- point-source fields 3=11866
- rough surface, amp. and phase fluctuations, correlation functions 3=16708
- sea surface 3=9559
- shallow water, bottom and surface 3=1773
- sinusoidal surface, ampl. and phase fluct. 3=14268
- from sinusoidal surface, plane wave 3=18929
- sonar eqns., generalized form 3=3854-5
- submarine detection, early 3=14278
- undulating sea surface, statist. characteristics 3=14269
- uneven surface, amplif. and phase fluctuations 3=14265

acoustic waves, ultrasonic

- back, obliquely incident to solid surface in water 3=18930
- pulse-analysis testing, det. of geometry of defects 3=11302

electromagnetic waves

- aurora, ionization meas. 3=13793
- aurora, oblique, 90 Mc/s 3=25934-5
- by cone, hollow 3=12311
- crystals, total internal, nonuniform waves 3=15845
- filter, resonance, totally reflecting 3=17050
- homogeneous absorbing layers and short-circuit plate 3=4270
- ionized media, indep. moving boundary 3=5844
- ionosphere, curved anisotropic, v.l.f. mode 3=19462
- ionosphere D-region, 2-7 Mc/s 3=6978
- ionosphere, deviative region, differential eqn. 3=5865
- ionosphere, E-region, rate of height descent at sunrise 3=3500
- ionosphere, exponentially, varying, in v.l.f. 3=19463
- ionosphere, not sharply bounded 3=9955
- ionosphere, perturbation calc. 3=21053
- ionosphere, pulse reflection and Epstein profile 3=16251

Reflection — contd

electromagnetic waves — contd

- ionosphere, sech² model, long waves 3=2134
- ionosphere, stratified, anisotropic, long waves 3=2135
- ionosphere, treated as stratified plasma 3=16256
- ionosphere, 2.28 Mc/s pulsed, phase fading 3=4278
- by magnetization wave in a ferrite, Doppler effect 3=4269
- magnetoplasmas, microwave reflection 3=24289
- meteor trails, Brysk analysis, criticism 3=16427
- microwave obs. of oscillistor carrier behaviour 3=10862
- microwave, by Permalloy films at ferromag. resonance 3=11105
- microwave, by plasma, high electron density meas. 3=12181
- moon, rel. to statist. model of surface 3=1513
- nonlinear optics 3=14770
- plane-parallel layer, wave optics 3=9605
- plasma, hot, mag. confined, right-circularly polarized microwaves 3=19252
- from plasma, moving 3=12141
- by plasma, moving, high-density, in semicond. depletion layer, for min. wave generation 3=9927
- plasma, pulse, for transient meas. 3=24301
- and semiconductor carrier lifetime meas., high cond. 3=20296
- semiconductor plasma, pinched, moving 3=17827
- semiconductors, microwaves, theory and expt. 3=23043
- slot absorbers, 10-14 kMc/s 3=24474
- surface waves, over dielectric guiding surface 3=24469
- total, dielectric prism, damping, "bending" waves 3=19444
- by Vlasov-plasma half-space 3=19253
- waveguide, closed end, arbitrary angle end 3=19449
- wind meas. using radar Doppler shift 3=1433

Light

See also Mirrors; Optical films

- alkali metal films, phase difference 3=18387
- amplitude and energy coeffs., theory 3=1789
- from boundary of a cloud 3=9043
- cirrus clouds, i.r. meas. 3=18219
- crystal, absorbing, arbitrary 3=15648
- crystals, spectra, rel. to nature of incident light 3=9600
- at electrochemical boundary layers 3=11933
- elliptical cylinder, pumping radiation 3=14332
- at glass-metal interface, exptl. det. of phase change 3=24044
- grating, sinusoidal, and irregular surface 3=253
- in gyroelectric media 3=11925
- i.r. internal reflection appl. to surface study 3=18397
- i.r., meas. including both diffuse and specular refl. 3=16789
- magnification by reflecting surface 3=1788
- measurement, partially reflecting layers 3=21518
- metal surface, phase difference 3=16785
- metals of high purity 3=15531
- mirrors, contrast transfer analysis 3=14310
- molecular crystals, long wave theory 3=20428
- monodisperse lattices, Bragg refl. 3=13622-3
- multilayer dielectric films, theory 3=14360
- non-linear effects 3=11940
- non-linear, exptl. verification of laws, with laser 3=24017
- optical constants det. using dispersion relations 3=16790
- optical materials, infrared, bibliography 3=16750
- p-component, phase shift 3=16784
- phase charge, at boundary between media 3=21557
- phase shifts eval. 3=3865
- piezoelectric crystals, harmonic prod. obs., GaAs, Te 3=18956
- plane-parallel layer, wave optics 3=9605
- plates and lenses, flare meas. method 3=16801
- polarized light, teaching expts. 3=19029
- polybutyl methacrylate-isopropanol solns., critical opalescence 3=21353
- polymethyl methacrylate-butyl chloride solns., critical opalescence 3=21353
- polystyrene-cyclohexane solns., critical opalescence 3=21353
- reflectance ratios and optical consts. det. 3=6640
- semiconducting p-n junctions 3=23042
- semiconductors, plasma oscill. theory 3=8584
- simultaneous meas. of transmission and refl. coeffs. 3=18961

Reflection — contd

light — contd

- total "frustrated" reflection involving metals 3=14356
- transmission-like reflection fringes 3=9609
- white coatings which absorb. i.r., diffuse 3=16786
- AgCl, u.v. spectrum at 20°K 3=4959
- Bi, magnetoreflexion oscillations 3=8581
- CdTe, i.r., meas. 3=10812
- CdTe, refl. coefft. meas. 3=23067
- Cu, films, 4-20 mμ, anomaly 3=17996
- Ge, field-effect modulation 3=15572
- MgO particles, meas. on film 3=924
- MgO surface, for reflectance standard 0.3-2.6 μ 3=1786
- PbO films, rel. to preparation 3=8927

Reflectivity

See also Diffusion, light; Optical constants; Optical films.

- absorbing materials, selective, meas. using i.r. spectrometer 3=9598
- ceramics, rel. to irradiation 3=8585
- glass (BK7) X-rays, 1.54 Å 3=23093
- glass, rel. to irradiation 3=8585
- metallic oxides, 300-1000 mμ 3=13154
- ocean surface 3=9010
- optical constants by one-angle reflection 3=21517
- powders, theory 3=10901
- semiconductors, IV and III-V groups, u.v. 3=10908
- snow, angular dependence 3=11383
- solids, refraction determ., from results at two angles, graphs 3=11926
- Venus, high, and glaciation 3=9180
- Al, evap. in u.h. vac., i.r. reflectance 3=20443
- Al, films, decrease due to oxidation 3=23039
- Al films, vacuum u.v., oxidation effects 3=11883
- Al films, X-rays, 1.54 Å, 500-3000 Å thick 3=23093
- Al, vacuum u.v., 6-30 eV 3=13145
- Au-Ni thin films 3=8580
- Au-Pb films, diffusion effects 3=20226
- CdS, spectrum of wurtzite structure 3=8583
- CdSe, room, liquid N₂ temps. 3=20441
- CdSe, spectrum of wurtzite structure 3=8583
- CdTe, room, liquid N₂ temps. 3=20441
- CeB₆, and semicond. 3=20437
- GaAs 3=6641
- GaAs, fine structure and temperature dependence 130°-650°K 3=10909
- GaSb, fine structure and temperature dependence 130°-650°K 3=10909
- GaSb, spectrum fine structure in near u.v. 3=4961
- Ge, extreme u.v. 3=20436
- Ge films, 12-60 mμ, wavelengths 0.4-0.7 μ 3=10953
- Ge, fine structure and temperature dependence 130°-650°K 3=10909
- Ge, frustrated total internal reflection, surface levels 3=2989
- Ge, spectrum fine structure in near u.v. 3=4961
- Ge thin films, u.v. 3=2995
- Ge, u.v. line-shape and energy bands 3=17865
- Ge, vacuum u.v., 6 to 30 eV 3=13145
- Ge, var. with wavelength, and electron effective mass, As-doped 3=22930
- I crystals, specular, structure 3=6653
- InAs 3=10910
- InAs, fine structure and temperature dependence 130°-650°K 3=10909
- InAs-In₂Te₃ alloys 3=10910
- InSb 3=10910
- InSb, fine structure and temperature dependence 130°-650°K 3=10909
- InSb-In₂Te₃ alloys 3=10910
- In₂Te₃ 3=10910
- LaB₆, and semicond. 3=20437
- LiF, β-irradiated, vacuum u.v. 3=13178
- LiF, vacuum u.v., 400 to 1400 Å 3=13145
- MgF₂, films, on Al, 17 μ, minimum, after heating in vacuo 3=9601
- PbTe, i.r. 28°-296°K, rel. to carrier concentration 3=10907
- Pt films for vacuum u.v. 3=19005
- S, i.r. reflectance standard 3=11882
- Sb, vacuum u.v., 6 to 30 eV 3=13145
- Se thin films, u.v. 3=2995

Reflectivity — contd

- Se, vitreous and metallic, vac. u.v. 3=15651
- Si, rel. to energy band structure 3=4960
- Si, fine structure and temperature dependence 130°-650°K 3=10909
- Si thin films, u.v. 3=2995
- Si, u.v. line-shape and energy bands 3=17865
- SiO on Al mirrors, effect of u.v. irradiation on far u.v. reflectance 3=19004
- Sn, vacuum u.v., 6 to 30 eV 3=13145
- SnO₂, n-type films 3=6642
- Te thin films, u.v. 3=2995
- ZnS, in interband transition region 3=8582
- ZnS, spectrum of wurtzite structure 3=8583

Refraction

- See also Neutrons, refraction.
- crystals, transparent uniaxial, inhomog. waves 3=15642
- elastic waves, internal conical refraction in crystals 3=20098
- magnetohydrodynamic waves, gas, non-uniform mag. field 3=17043
- plasma, hydromag. waves 3=483
- Sommerfeld–Runge law in 3 and 4 dimensions 3=21
- waves in turbulent wake 3=23956

acoustic waves

- See also Dispersion, acoustic.
- focusing with spherical structures 3=9561
- h.f., formulae for general media 3=9931
- lenses, aberrations and focal surfaces 3=14271
- lenses, solid, amplification factor 3=14270
- point-source fields 3=11866
- by turbulent wake 3=23956

acoustic waves, ultrasonic

- use in shutter for lasers 3=12348
- CaCO₃, internal conical refraction 3=21500
- NaCl, internal conical refraction 3=21500

electromagnetic waves

- See also Electromagnetic wave propagation.
- in atmosphere, cm waves, radiometric det. 3=9949
- atmosphere, rel. to data at earth surface 3=21055
- atmosphere, errors in height finding 3=9948
- atmosphere, total, rel. to surface refractivity 3=9947
- in cloud of charged particles 3=9731
- ensemble-average wave in irregular gases 3=17048
- h.f., formulae for general media 3=9931
- ion ionizing medium, real and complex refr. index, review 3=5864
- ionosphere, D-region, rel. to electron densities 3=6983
- longitudinal waves, at dielectric–plasma boundary 3=9956
- microwave lens, Fresnel theory extension 3=2122
- plasma, cylinder, parabolic density profile 3=12140
- radar waves, in atmosphere 3=17061
- surface, rel. to transhorizon transmission loss 3=513
- surface waves, 9240Mc/s, structure 3=7698

light

- See also Double refraction.
- amplitude and energy coeffs., theory 3=1789
- crystal, rel. to circular optic axes 3=15648
- films, anomalous, in Drude eqns. 3=14357
- fluids, dense mixtures, Lorentz–Lorentz function 3=1709
- gas mixtures, second virial coefficients 3=3835
- Helmholtz eqn., Miyamoto–Wolf formula for vector pot., geometrical derivation 3=1785
- non-linear effects 3=11940
- rainbow in fountain 3=21521
- thin prisms, testing of deflection 3=235
- CHCl₃, second virial coeff. 3=3835
- CH₃F, second virial coeff. 3=3835
- CH₄, second virial coeff. 3=3835
- CO₂, second virial coeff. 3=3835
- N₂, second virial coeff. 3=3835
- O₂, second virial coeff. 3=3835

Refractive index

- cracks, in vitreous polymers meas. 3=8579
- e.m. waves, in atmosphere, up to 5000 ft. 3=7716
- gases, irreg. ionized 3=9730
- troposphere, refractive index irregularities 3=9051
- BaTiO₃, temp. var. 3=10903
- N¹⁴H₂, microwave region 3=21362

Refractive index — contd

- PbSe, meas. rel. to effective electron mass 3=10904
- PbTe, meas. rel. to effective electron mass 3=10904

light

- See also Dispersion, optical; Double refraction; Optical constants.
- anisotropic crystals, theory 3=2767
- and crystal excitons 3=17692
- crystals, cubic, O_h symmetry, theory 3=17922
- crystals, frequency shifting by Pockels effect 3=5536
- crystals, mag. absorbing optically-active 3=13148
- gas, ideal monatomic, complex index 3=1733
- gases, vac. u.v., using Cherenkov radiation 3=14214
- gases, vac. u.v., using Rayleigh scatt. 3=14215
- ionic crystals, with microdefects, exciton absorption region 3=23034
- molecular refractivities 3=15332
- optical materials, infrared, bibliography 3=16750
- optical system, rel. to spherical aberration 3=1792
- oxide films on Si 3=25439
- oxide glasses, 0.4–5.3 μ 3=20439
- Perspex, pressure coeff. 3=25056
- polarized light, teaching expts. 3=19029
- quartz, on fast n irradi. 3=17929
- sapphire, synthetic, 0.265–1.586 μ 3=2992
- solids, from reflectivity at two angles, graphs 3=11826
- water, and polarizability, temp. var., cavity radius 3=23899
- wavelength var., Herzberg equation test 3=20432
- Al, 300 to 800 Å 3=25434
- Ar. solid. meas. 3=15647
- Ar, vac. u.v., using Cherenkov radiation 3=14214
- As₂Se₃-type glasses, 400–800 cm⁻¹ 3=10930-1
- CdS crystals, out to 1.4 μ 3=13152
- CdTe meas. 3=23067
- CeO₂–CeF₃, optical films, evaporated 3=23035
- GaAs 3=6641
- Ge films, rel. to evaporation parameters 3=20926
- Ge–ZnS films, 2.2 μ 3=10952
- H, liquid, density and temp. var., normal and para. 3=21363
- He⁴, vapour and liquid, near crit. temp. 3=9669
- I crystals 3=6653
- In films on glass substrate, 400–1000 mμ 3=25435
- LiF, β-irradiated, vacuum u.v. 3=13178
- Mg₂Si, Mg₂Ge, Mg₂Sn, 7–10 μ 3=8576
- MoS₂, thin crystals 3=10957
- N₂, vac. u.v., using Cherenkov radiation 3=14214
- PbMoO₄ 3=20479
- PbS, dispersion near fundamental absorpt. edge 3=25436
- Si, from reflectivity at two angles, using graphs, extreme u.v. 3=11826
- Si, meas. in i.r. 3=20433
- SiO₂ films on Si, meas. 3=13149
- Sr molybdate crystals 3=13150
- Te, polycryst., i.r. meas. 3=13151
- Ti, i.r. meas., rel. to electron groups 3=17977
- TiO₂, antase and brookite 3=20052
- TiCl₃, wavelength depend. 3=3023
- Tl₂SO₄–H₂O system, rel. to sedimentation 3=5172
- V, i.r. meas., rel. to electron groups 3=17977
- ZnO, rel. to polarization 3=957
- ZnS crystals, out to 1.4 μ 3=13152

Refractive index measurement

- cryostat, liquid-He, for low temp. meas. 3=3874
- films, inhomogeneous, Vašíček procedure 3=1826
- films, nonabsorbing, Vašíček procedure 3=1825
- inert gases, 77°-273°K and up to 100 atm. 3=7313
- interference films, immersion spectrophotometry 3=11917
- of lenses, non-destructive method 3=236
- liquids, absorbing, very small differences, measurement 3=11899
- solutions, incremental, by interference microscope and photoelectric indicator 3=14323
- thin film on base of similar material, small difference meas. 3=24007
- by wavefront-shearing interferometer 3=11836
- use of waves generated at interface 3=18751
- Ar, 1600 Å 3=9592
- HgCl₂, fused, rel. to temperature 3=11796
- KBr, fused, rel. to temperature 3=11796

Refractive index measurement — contd

- KCl, fused, rel. to temperature 3=11796
- KF, fused, rel. to temperature 3=11796
- KNO₃, fused, rel. to temperature 3=11796
- KSCN, fused, rel. to temperature 3=11796
- K₂SO₄, fused, rel. to temperature 3=11796
- LiBr, fused, rel. to temperature 3=11796
- LiCl, fused, rel. to temperature 3=11796
- LiF, fused, rel. to temperature 3=11796
- LiNO₃, fused, rel. to temperature 3=11796
- Li₂SO₄, fused, rel. to temperature 3=11796
- Na₂AlF₆, fused, rel. to temperature 3=11796
- NaBr, fused, rel. to temperature 3=11796
- NaCl, fused, rel. to temperature 3=11796
- NaF, fused, rel. to temperature 3=11796
- NaNO₃, fused, rel. to temperature 3=11796
- Na₂SO₄, fused, rel. to temperature 3=11796
- Na₂WO₄, fused, rel. to temperature 3=11796
- PbCl₂, fused, rel. to temperature 3=11796
- TlCl, fused, rel. to temperature 3=11796
- ZnCl₂, fused, rel. to temperature 3=11796

Refractometers

- automatic flow refractometer, differential system 3=21531
- cell for cryogenic temps., pressures up to 100 atm. 3=7313
- rod, extension of sensitivity and range 3=11897

Refrigerators

See Low temperature production.

Relativity

- causality 3=5330
- conformal invariance at very high energies, exptl. consequences 3=12430
- discussions with Einstein 3=3699
- Doppler effect, transverse, meas. in accelerated system 3=9332
- ether drift meas., first-order, using lasers 3=5343
- ether drift, rel. to beam-type maser oscillation frequency 3=12357
- experimental checks with molecular and atomic frequency standards 3=21214
- general covariance, rel. to weak and strong interactions 3=10032
- gravitational radn. by relativistic particle 3=5335
- inertia due to cosmic gravitational field 3=16504
- inertial rotation in weak gravit. field 3=9331
- magnetohydrodynamics, equations 3=4256
- Maxwell eqns., relativistic formulation 3=14739
- motion, group theory treatment 3=19
- particle pot. energy rel. to creation and destruction of matter 3=5338
- preferred velocity existence 3=1
- quantized space-time, parametrizations 3=7119
- quantum theory, microvariance and micro-causality 3=21234
- relativistic cosmology, photon fluid models 3=1505
- relativistic eqns., group props., Racah approach 3=3725
- relativistic particle kinematics, geometric soln. 3=9323
- relativistic theory of motion, internal degrees of freedom 3=21204
- and tensor calculus, book 3=31
- thermodynamics, elastic waves vel. 3=7094
- time machine speculations 3=11659

general

- See also Cosmology; Gravitation.
- aberration and Doppler effect, in Schwarzschild universe 3=14011
- action principle, deriv. of field eqns. 3=1599
- astronomical orbits, effect of great eccentricity 3=21221
- asymptotic invariants in grav. radiation fields 3=18706
- axially symmetric conformastat electrovac universes 3=9337
- book 3=24
- Cauchy problem, variations and equations with initial conditions 3=23756
- centripetal force reactions, aberrated, grav. theory 3=21224
- clock in free motion, kinemat. and grav. effects 3=7109
- completeness of space-times, definitions 3=9343
- complex scalar fields introd. 3=7104
- rel. to conformal tensor calculus, review 3=5317

Relativity — contd**general — contd**

- conservation laws and Lagrangian from field eqns. 3=3739
- conservation laws, "symmetry method", 3=11684
- control and generation of gravitational forces 3=11678
- co-ordinate transform. to uniform, accel. frame 3=1586
- cosmology, grav. eqn. and isotropic model 3=23661
- covariance, validity in a quantum theory 3=14007
- curvature perception by 2-dimensional beings 3=23754
- curvature waves, defin. and linear approx. 3=1601
- Dirac-Lichnerowicz theory, use of Franz-Kofink formula 3=36
- Dirac matrices, symmetrical form 3=18713
- discontinuities, geometrical study 3=23755
- distortion in metric of small body by grav. attraction of large mass 3=16512
- Doppler effect for group motions, and Mössbauer effect 3=16513
- e.m. field, energy-momentum tensor, uniqueness 3=1604
- e.m. or gravitation radiation recoil 3=16515
- Einstein field eqns., divergence conditions 3=16500
- Einstein field eqns. with simply transitive groups of motions 3=16509
- Einstein spaces with maximum mobility 3=5346
- Einstein's equations, stability, infinitesimal 3=9339
- Einstein's four-tensor 3=21223
- elasticity theory 3=7102
- electrodynamics in the expanding universe 3=21085
- electromagnetic waves, plane, in vacuo, solution 3=18721
- electron, classical point, Poincaré compensating stresses 3=1584
- energy density, positive-definite, and local space 3=7106
- energy excess, static solns. 3=5354
- energy-momentum tensor requirements, gravit. field 3=14012
- equivalence, strong, proposed test 3=5350
- Euclidian re-statement, three tests 3=23757
- in Euclidean terms 3=7107
- expanding universe, grav. canonical formalism 3=39
- experimental verifications, using new metric 3=21225
- Fermi Normal Coords., in differential geom. 3=16511
- flatness, conditions 3=23750
- flat-space metric 3=14015
- flow surfaces, viscous fluid 3=14099
- fluid mass, rotating, grav. field 3=1600
- fluids, charged, characteristic surfaces 3=18713
- force effect, non-gravitational 3=3730
- and fundamental particle theory 3=23652
- and fundamental particles, mass spectrum 3=14873
- generalized Schwarzschild space, flatter regions 3=18717
- geodesic deviation equation 3=14010
- geodesic hypothesis in gravitation theory 3=3721-2
- geometry, differential, rel. to 3=3735
- Goldberg-Sachs theorem, generalization 3=14016
- grav. field eqns., Ozsvath-Schücking soln. 3=3736
- gravitation fields with zeros for $g_{\mu\nu}$, determinant 3=1596
- gravitation, flat space theory, energy-momentum tensor choice 3=16498
- gravitational field energy and g_{00} 3=14002
- gravitational fields, one dimensional 3=5333
- gravitational Lagrangian, polynomial expansion, quantization 3=16502
- gravitational waves 3=21211
- Green's functions in Riemann space, calc. for weak fields 3=16510
- harmonicity condition, coordinate 3=23751
- inertia, rel. to mass change of universe 3=11497
- initial conditions on a characteristic half-cone 3=18715
- light deflection effect to test theory 3=5347
- light deflection by sun 3=38
- light deviation at solar limb, meas. 3=3731
- light-ray reflection in galactic gravitational fields 3=21119
- Lorentz group, restricted, and holomorphically related groups. 3=5320
- Lorentz-invariant eqns. of motion of point masses 3=37
- Mach's principle 3=2
- Mach's principle and creation of matter. 3=5235
- Mach's principle, and finite universe 3=5348

Relativity — contd

general — contd

- Mach's princ., rel. to steady-state cosmology 3=11502
- Mach's principle, validity 3=23753
- matter waves of spin 0 and 1 3=14025
- mechanics and fundamental particle interaction 3=17168
- meson, scalar, Klein—Gordon equation 3=19547
- Mies' Lagrangian, restrictions 3=14009
- Møller energy-momentum tensor, deviation using Schrödinger affine theory 3=9338
- Mossbauer effect, appls. 3=12565
- motion of point masses, Lorentz-invariant eqns. 3=37
- neutron core, massive, stability 3=7036
- Newtonian eqns. of motion rel. to Einstein grav. theory 3=23758
- operative interpretation of standard quantities 3=1598
- photon—graviton interaction in first approx. 3=5349
- physical geometry and universal forces 3=14008
- physical space, curvature verification difficulty, 3=11683
- Planck's constant, gravitl. origin 3=1605
- Planck's constant, rel. to red shift 3=1606
- point masses in Kepler orbit, grav. radiation 3=16514
- propagators and commutators 3=3733
- proper volume elements 3=14014
- radiation fields, pure, twist-free, fld. eqn. exact soln. 3=3732
- relativity theory of dielectrics 3=1607
- Riemannian spaces, undulatory 3=18719
- rotating bodies, grav. and e.m. fields 3=3734
- Schwarzschild field in n -dimensions, dimensionality of space problem 3=7105
- Schwarzschild metric, empty-space generalization 3=18716
- Schwarzschild solution, from Newtonian gravitation 3=18718
- self interaction, and field theory of spin two in flat space 3=21222
- semi-closed worlds, theory 3=1588
- space—time transformations, phys. signif. and representation theory analysis 3=3712
- space-times and fields, asymptotic props. 3=9342
- space—times, spherically symmetric, and their imbeddings 3=23752
- spaces conformal to a class of spaces 3=21228
- spherically-symmetric manifolds embedded in flat manifolds 3=1597
- stationary solns., everywhere regular 3=35
- tetrad formulation, generalized 3=21226
- tetrad orientability in electrodynamics 3=21227
- three-body problem, coplanar, canonical reduction 3=5231
- two-body problem, parameter variation meth. applic. 3=3729
- uniformly accelerated motion, transformation 3=7103
- virial theorem in post-Newtonian approx. 3=18720
- weighted mean Christoffel symbols, associated space-times 3=16516
- Weyl's solution for axial-symmetric gravitational fields 3=14013

special

- accelerating reference frames, clock paradox 3=9334
- action principle, Lorentz-invariant, nonlinear 3=18767
- in anisotropic space 3=21216
- Brehme diagram, applications 3=9335
- clock paradox 3=5339
- clock paradox 3=16506
- conditions for agreement of quantum field theory 3=4315
- conformal coords. for space-like motions 3=11682
- contraction rel. to stress effects 3=1589
- co-ordinate transform. to uniform, accel. frame 3=1586
- crystallography, macroscopic symmetry in space—time 3=23366
- de Broglie wave mechanics, re-exam. 3=16527
- electromotive force, Faraday's law, analysis 3=17031
- energy—momentum tensors, physical equiv. 3=3711
- ether drift detection, interferometer and laser aerosol scatt. proposal 3=18711
- ether drift test by masers, theory 3=3727
- five dimensional temporal extension 3=21220
- force transformation laws 3=21217
- geometrical introdn. 3=34
- gravitation field, Euclidean theory, energy 3=3715

Relativity — contd

special — contd

- gravitational field, relative localization 3=1590
 - gravitational field theory, Euclidian, action-integral identities 3=9329
 - gravitational field theory, Euclidian, energy—momentum 3=9330
 - heat and temp. Lorentz transformation 3=24070
 - inertial reference frames, misconceptions, critique of Sherwin's conclusions 3=1587
 - kinematics, relativistic and classical, common postulates 3=16508
 - kinetic theory of gas in grav. field 3=21215
 - Lorentz contraction obs., light finite velo. effects 3=18710
 - Lorentz contraction, stress effects 3=11681
 - Lorentz frames, geometric representation 3=21218
 - Lorentz-invariant linear eqns., analytic solns. 3=3728
 - Lorentz transformation in undergraduate curriculum 3=14004
 - Lorentz transformation, teaching aid to illustrate 3=23748
 - Lorentz transformations, general, axiomatic deduction 3=32
 - Michelson-Morley experiment, alternative deduction 3=5345
 - momenta, addition law, for interaction 3=5342
 - moving light-sources and objects, observation 3=7101
 - multipole moments, rel. to X-ray scattering by particle of arbitrary mag. moment 3=23749
 - non-selfconsistency, theory 3=21513
 - paradoxes, geometrical approach 3=21219
 - particles travelling faster than light 3=33
 - proper mass, positive, negative, imaginary 3=7092
 - radiation irreversibility rel. to expansion of universe 3=16322
 - re-entrant motion and clock paradox 3=16507
 - rigid-body translations, relativistic 3=14005-6
 - rotating disk, edge velo. 3=9336
 - space—time discontinuum in $h-c-l_0$ theories 3=9328
 - space—time, macroscopic and microscopic concepts 3=5340-1
 - tests using masers, optical ring, travelling-wave 3=9401
 - time dilation formula, proof using photon clocks 3=9333
 - time dilation meas. using μ -mesons 3=11680
 - time gradient as fundamental magnitude 3=16505
 - time meas., in accelerated frames, review 3=18712
 - transformations between moving observers, integrable 3=3726
 - two-particle system, kinematics 3=11674
 - velocity, light, effect of receiver velocity 3=7303
 - velocity, light, Einstein's postulate test, comments 3=23996
 - velocity, light, moving source, Kantor's expt., explanation 3=18957
 - velocity of light, one-way, 2nd order constancy 3=5344
 - velocity meas., light, moving sources 3=18958
 - velocity transformation, geometrical demonstration 3=23747
 - wave propagation, space and time isotropy 3=5332
- unified field theories**
- causality and multiply-connected space-time 3=20
 - Coulomb's law basis 3=7108
 - differential varieties whose coordinates belong to a quadratic extension of the real field 3=14018
 - Einstein, composite field 3=1602
 - Einstein, composite field, grav. eqns. 3=3738
 - Einstein eqn. in terms of $g^{\mu\nu}$ 3=9340
 - Einstein's field equations, particular solutions 3=16517
 - electromag. field, non-singular, associated with Bonnor vacuum grav. field 3=16519
 - elementary particles, development 3=12382
 - geometrostatics, interaction energy 3=16518
 - "gh field" theory of Djuric, reply to criticism 3=5351-2
 - gravitation and e.m., using action function 3=1603
 - H_{55} term in theory of photons, gravitons and Dirac particles 3=9341
 - Jordan—Thiry eqns., static solns. 3=11685
 - Jordan—Thiry equations, solutions, spherically symmetric, $k \neq 0$ 3=18722
 - meson scalar field, in Jordan—Thiry theory 3=23759
 - quantum-relativistic for interacting fields, macroscopically causal, possibility 3=11686

Relativity—contd**unified field theories—contd**

- Rayski, baryon interact. with grav. and e.m. fields 3=4334
 Ravski, vector boson field eqns. 3=3737
 Riemann tensor splitting 3=5353
 simplifications 3=18723
 summary of 1934-44 developments 3=14017

Relaxation

- See also Acoustic wave propagation; Dielectric phenomena; Elastic relaxation; Ferroelectric phenomena; Ferromagnetic relaxation; Molecules, relaxation; Nuclear magnetic resonance and relaxation; Paramagnetic resonance and relaxation.
 dipole orientation, in organic liquids, from light scattering 3=7207
 gas of rough spheres, effects in transport props. 3=9495
 plasma, ion velocity distrib., theory 3=4111
 quantum systems 3=21255
 quantum theory 3=5373
 spin relaxation, Fokker-Planck eqn. 3=1623
 two-spin system, theory 3=1624
 Br, and acoustic absorption, liquid and solid 3=9458
 O¹⁸, in ice, and defect, new type 3=6512
 ThO₃-CaO solid solution, dielectric and mechanical 3=20700

Resistance, electrical

- See also Conduction, electrical; Conductivity, electrical; Contact resistance; Magnetoresistance; Piezoresistance.
 a.c., for conductors of arb. cross-section 3=16900
 alkali antimonides, 200 Å thick rel. to formation time 3=25351
 anisotropic media, electron scatt. effects 3=25316
 brasses, abnormal, criticism of conclusions 3=15535
 bronzes, Al, abnormal, criticism of conclusions 3=15535
 copper phthalocyanine, crystals, effect of halogens 3=6593
 dividers, d.c., calibration by a.c. inductive divider 3=21673
 ferroelectric ceramics with positive temp. coeff., current regulation 3=25395
 ferromagnetics at low temp., magnetic contribution 3=15532
 graphite, 20-200°C, $3 \times 10^4 - 2.5 \times 10^5$ kg/cm² 3=6557
 induction method to meas. low resistances 3=19126
 inert gases, negative resistance 3=21449
 measurement, effect of capillary constraints 3=7410
 measurement of high, ballistic galvanometer 3=24163
 measurement, linear ohmmeter, $10^{-3} - 2 \times 10^6 \Omega$ 3=16884
 metal contacts, tunnel resistance 3=15537
 metal films 3=15537
 metal films, resistance-strain characteristics 3=22902
 metal lattice, residual resistivity of defect pairs 3=8486
 metals, films, effect of adsorption of electropositive atoms 3=13040
 metals of high purity 3=15531
 metals, rel. to defect-induced electron-phonon interactions 3=22674
 negative, differential, due to tunnel effect 3=20298
 Ohm's experimental work 3=21692
 for plasma generation, variable, up to 400 A d.c. 3=9694
 rare-earth metals, rel. to temp. 3=25525
 rare-earth metals, theory, rel. to mag. transitions 3=13032
 resin-bonded carbon, piezo-resistive effect, use for pres. meas. 3=21288
 semiconducting diode, tunnel, negative, meas. 3=22964
 semiconductors, non-ohmic behaviour, acoustoelec. current 3=2876
 solids, impurity, theory 3=22885
 strip conductors with rt.-angle bend 3=9712
 thermo e.m.f. rel. to 3=23025
 unit, meas., review, absolute, rel. to international 3=21189
 Al oxide films, negative resistance 3=20321
 Al, rel. to vacancies, dislocations, and stacking faults 3=22891
 Al-Mg dil. alloys, rel. to vacancy-impurity interaction 3=22746
 Al-Sn dil. alloys, rel. to Sn-vacancy interactions 3=22744
 Au films and contacts 3=15537
 Au, rel. to lattice vacancies 3=22893

Resistance, electrical — contd

- BaTiO₃ ceramics, temp. var., anomalous, -180° to +200°C, intergranular barrier model 3=25399
 Bi and Bi-Sb alloys, var. with grain size 3=20323
 Bi, non-ohmic behaviour, acoustoelec. current 3=2876
 Cd, rel. to impurity 3=25324
 CrTe_x 3=23464
 Cu and Cu alloys, rel. to stacking-fault electron scattering 3=22795
 Cu, strip cold rolled from powder, along and across rolling direction 3=22900
 Cu-Si-(Mn) alloys, rel. to deformation and annealing 3=22701
 Cu, Au, after quenching, long-range order 3=20889
 Dy films, spin-ordering effects 3=15547
 Fe wires, hydrogen-charged 3=10721
 GaAs_{1-x}P_x semiconducting p-n junctions, temp. var., direct-indirect transition 3=25377
 Gd films, spin-ordering effects 3=15547
 Ge, films, in ultra-high vacuum and acceptor levels 3=20309
 In, rel. to impurity 3=25342
 InSb, rel. to temperature-pressure phase diagram 3=20771
 Li, pressure coeff. at low temps. 3=22895
 Ni, films, effect of adsorption of Ba 3=13040
 Ni, films, effect of O₂ and BaO adsorption 3=20271
 Ni, after plastic deform. 3=20206
 Ni-Co alloys, after plastic deform. 3=20206
 Ni-Cu alloys, after plastic deform. 3=20206
 Pb, rel. to impurity 3=25324
 Pu, increase rel. to self-irradiation damage 3=22856
 S, temp. var., polycrystalline 3=10839
 Sn, rel. to impurity 3=25324
 Ta-C, rel. to composition 3=25368
 Tb films, spin-ordering effects 3=15547
 U, α, anisotropy 3=22899
 W, films, effect of adsorption of Cs 3=13040
 Yb, effect of temp. and press. 3=13038
 Zn, rel. to impurity 3=25324
 ZnTe 3=25374

Resistance thermometers

See Thermometers, resistance.

Resistivity

See Conductivity, electrical.

Resolving power, optics

- See also Optical instrument testing.
 magnification beyond Rayleigh's limit 3=14316
 monochromators, prismatic and grating, review 3=14352
 photographic emulsions, effect of grain 3=5541
 photographic lens-emulsion system 3=21575
 telescope, rel. to 2 point sources of differing intensity 3=3873

Resonance spectra

See Spectra, resonance.

Resonators

- piezoelectric, thickness-mode 3=7266
 response when mounted on shock-platform 3=14247
 acoustic.
 See Acoustic resonators.

electromagnetic.

See Electromagnetic oscillations.

Reverberation

- See also Architectural acoustics; Echo.
 chamber, sound distrib., 125-500 c/s 3=1776
 coupled halls 3=21504
 impulse noise assessment, effect on 3=3680
 measurement, different impulse sources 3=18948
 by ocean surface and bottom 3=16202
 time, effect of sound velocity 3=11874

Reviews

- alkali halides, A-centres 3=22838
 alkali metal thin films, electrical and photoelec. props. 3=15550
 analyticity of perturb. expansions 3=24665
 appearance-potential meas. by space-charge compensation 3=21700
 arc physics 3=7482
 astronomy, television, closed-circuit, appls. 3=16313
 astrophysics and cosmology of fundamental particles 3=23652

Reviews—contd

atmosphere, upper, densities, ion, electron, neutral. 3=25916
 atmospheric electricity. 3=25889
 atmospheric i.r. transmission 3=3468
 atmospheric tracers and general circulation 3=23587
 atomic masses 3=10221
 atomic polarizabilities and shielding factors 3=8173
 atomic spectroscopy 3=19916
 atomic structure theory, Bohr contribution 3=19915
 aurora and nightglow, I.G.Y. and I.G.C. research 3=16282
 auroral theories, observational data 3=13797
 biology heredity "code" as D.N.A. nucleotide sequence, review 3=18669
 boundary layers, turbulent, heat transfer 3=11968
 bubble chambers 3=17123
 ceramic dielectric materials, development 3=20370
 ceramics, polycryst., mech. behaviour 3=23357
 Cherenkov radiation theory 3=14951
 Cherenkov and transition radiation 3=17239
 cloud physics 3=1439
 colour theory 3=11881
 colour vision, discrimination theory 3=5306
 computers in structure analysis, conference, Moscow 1961 3=16063
 conformal tensor calculus 3=5317
 cosmic ray showers, high-energy theories 3=4546
 cosmic rays, extensive air showers 3=22235
 cosmic rays, origin, primary, radiation, r.f. 3=22223
 cosmological hypothesis 3=25970
 crystal dislocations, X-ray obs. 3=22782
 crystal excitons, especially Cu_2O , CdS , HgI_2 , spectra 3=22689
 crystal structure, atomic, transition metal sulphides, groups IV, V, VI 3=23449
 crystal structure calc. by image-seeking 3=1317
 crystals, electron energy spectrum, calc. methods 3=4843
 d.c. cond. of macromolec. substances 3=20367
 deformation, high temp., crystals, and diffusion 3=23329
 diamond, spectrum, i.r., Raman's work 3=23069
 diamonds, fracture, cleavage, defect effects 3=23362
 diatomic mols., intensities of electron transitions 3=15335
 diffraction 3=1834
 diffractometers, X-ray and neutron, automatic 3=8818
 diffusion and deformation, high temp., crystals 3=23329
 diffusion in metals 3=12997
 diffusion in metals 3=15507
 discharges of "classical" gas, to plasma physics 3=9764
 e.s.r. spectrometers 3=24488
 earth, magnetic field, space research 3=25937
 electrodynamics, dispersive medium 3=17033
 electroluminescence in Zn and Cd sulphides 3=13220
 electron microscope crystallog., image contrast effects 3=1313
 electron microscopy, "state-of-art" survey 3=21881
 electron-positron interactions, high energy 3=24692
 electrophotography Nov. 1960 symposium 3=16815
 elementary particles, developments 3=4365
 elementary particles, interactions, resonances 3=24670
 elementary particles, unified field theories 3=12382
 equations of state, theoretical survey, statistics 3=20116
 ferro- and antiferromagnetism, modern theory 3=6697
 ferro- and antiferromagnetism, Soviet, work since 1958 3=1135
 ferromag. relaxation theory, present status 3=1162
 ferromag. thin films 3=6710
 ferromagnetic domain obs. 3=23161
 ferromagnetic films, resonance 3=21374
 ferromagnetism, spin-wave quantum theory 3=15766
 fibre optics 3=241
 field theory, quantum, interactions, weak, recent developments, semipopular 3=17193
 flame spectra 3=10483
 fundamental particles, new unstable objects 3=4364
 gamma-rays, internal conversion, results 3=24879
 γ -spectroscopy, 1947-62 3=24683
 garnets, ferro- and antiferromag. props., Russian work 3=3092
 gas determination in metals 3=11370
 gases, collision phenomena 3=12078

Reviews—contd

generation of high mag. fields 3=21930
 geophysical exploration, techniques 3=1409
 gravitation and mass, cosmology, historical 3=21213
 gravitation theory, observational tests 3=3717
 gravitational waves 3=21211
 gravity measurement 3=5181
 hardness of diamond 3=25645
 heat transfer, work in 1962 3=24071
 heterogeneous nucleation 3=11206
 hodoscopic systems with controlled pulse supply 3=24190-1
 human radiation hazards 3=3645
 hypernuclei, non-technical 3=631
 hyperons, interactions, weak, recent developments, semipopular 3=17193
 interaction of radiation with matter 3=2841
 ion emission and microscopes, field 3=19371
 ionic crystals, exo-emission 3=19295
 ionic crystals, lattice defects rel. to solid state reactions 3=12956
 irradiation effects in metals 3=4895
 irradiation effects in metals 3=4897
 irreversible processes, general theories 3=21251
 isotope effects, crystal structure, atomic, temp. var. 3=23439
 jets 3=4543
 lasers 3=14799
 lasers, solid state, properties 3=22009
 lattice dynamics, Born theory and recent techniques 3=22634
 lepton theory 3=4359
 leptons, experimental 3=4358
 light sources, pulsed 3=1812
 liquids, luminescence quenching by foreign substances 3=21382
 liquids, X-ray study 3=21303
 magnetic computer memories 3=14729
 magnetic fields, strong, production 3=24428
 magnetic storms, current theories 3=3518
 magnetism, theory, at Harwell 3=978
 magnetohydrodynamic power generation 3=5833
 magnetohydrodynamics 3=12297
 magnetothermal effects, theory 3=466
 magnets, high-field, superconducting, pulsed 3=21932
 masers, optical 3=7728
 masers, optical 3=22006
 masers, optical, gaseous 3=7730
 masers, optical, non-linear interactions 3=17093
 masers, optical, plasma, emission and pumping 3=22007
 mass spectrometry of solids 3=14685
 mass spectrometry, vacuum techniques 3=12263
 mechanical strength, crystals 3=25626
 mesons, interactions, weak, recent developments, semipopular 3=17193
 metals, electrical resistance and spin disorder 3=10715
 metals, electromigration, review 3=22829
 metals, f.c.c., irradiated, point defects, review 3=8420
 metals of high purity 3=15531
 metals, liquid, electron transport and states 3=21401
 metals, physical props. at high frequencies 3=6448
 metals, radiation damage, nature 3=8466
 metals, theory, mag. particular reference to Frenkel's early work 3=22888
 meteorological studies by satellite, non-Russian 3=18492
 meteors, composition and origin 3=16366
 microscopy, optical, expanding applications 3=1803
 molecules, electronic structure, quantum-mechanical theories 3=22533
 molecules, simple, electronic states and spectra, computer calc. 3=10500
 monochromators, prismatic and grating, resolution 3=14352
 Mössbauer effect 3=4557
 Mössbauer effect 3=19755
 Mössbauer effect, popular 3=20066
 Mössbauer effects, solids 3=25170
 n.m.r. instrumentation 3=14789
 n.m.r., principles and use in phys. chem. 3=25139
 n.m.r., u.s. stimulation 3=20665
 negative ions, radiative formation and destruction 3=4003

Reviews—contd

neutrinos, known properties and role in astro-
physics 3=24686
neutrinos, 2 types, theory 3=24687
neutron beams, production 3=24744
neutron cold beams production and uses 3=24745
neutron diffraction crystallog. techniques, recent
progress 3=1289
neutron dosimeters 3=17292
nuclear excitation, collective, by scattering, inelastic,
charged particles 3=22287
nuclear fusion research, Salzburg conference 3=15251-2
nuclear mag. resonance, liquids 3=14184
nuclear magnetic resonance, use in study of
solids 3=3189
nuclear physics, high energy, conference 3=17094
nuclear reaction mechanisms 3=12647
nuclear reactions, single-channel, phase shift
analysis 3=12650
nuclear reactor metals, aqueous corrosion 3=695
nuclear reactors, fast, world survey, in tabular form 3=6318
nuclear relaxation in magnetic materials 3=1198
nuclear science and technology, advances 3=2511
nuclear structure, spectroscopy and reactions 3=12548
nuclear structure study with nuclear reactions 3=24915
nuclei, light, shell theory 3=7963
nucleons, two, interactions 3=14973
nucleus, optical model 3=17388
objectives, ultra-rapid, limitations 3=16814
optical harmonics and nonlinear phenomena 3=21505
optical image evaluation, using transfer function 3=11887
optical instrument testing 3=244
optical masers 3=9964
paramagnetic crystals in laser and microwave
devices 3=24505
paramagnetic relaxation, theory 3=23219
phosphors, electroluminescent, pulse excitation 3=18047
photodisintegration of light nuclei 3=19831
photoelectric emission from semiconductors 3=19312
photography, ultrahigh-speed, instruments 3=21579
photon and electron high-energy physics, review
lecture 3=14932
photon and electron interaction in crystals 3=10101
photon scatt. by gas molecules 3=7245
 π -N resonances 3=4430
piezoresistance of Si and Ge 3=2965
planets, interior constitution 3=16335
planets, microwave radiation, as research tool 3=18599
planets, radioastronomy, review 3=18652
plasma and controlled fusion 3=384
plasma electron and ion resonances 3=7616
plasma oscillations, nonlinear mathematical
theory 3=19287
plasma prodn. by e.m. driven shock waves 3=7684
plasma, radiation, laser, emission and pumping 3=22007
plasma, spectral meas. techniques 3=7577
plastic flow and crystal fracture 3=25626
polymerization, graft, radiation-induced 3=8959
porphyrins, spectroscopy 3=25129
precipitation 3=20893
probe, Langmuir, dynamic studies 3=1993
proton synchrotrons, high energy 3=19389
pulsed spark gas discharges, for light sources 3=14546
quantized systems, large, perturbation theory 3=21256
quantum field theory, local invariance and compensating
fields 3=14021
quantum physics 3=3740
radiation belt, outer 3=16283
radiation reaction, classical theories 3=17163
radioastronomy, galaxy (class II) sources 3=18662
radioastronomy, planets, review 3=18652
radionuclide power generators 3=12063
reactor science 3=2512
relativity time meas., in accelerated frames 3=18712
resonance effects in matter 3=5031
rock magnetism, continental opposite
magnetization 3=3522
rods and plates, transient wave propagation 3=21472
S-matrix theory and dispersion relations 3=24643
satellite tracking methods 3=21141

Reviews—contd

satellites artificial rel. to atmosphere and
electrons 3=25990
scintillation counters 3=22032
semiconductor band theory, review of recent
progress 3=10746
semiconductors, effective mass measurements 3=10743
semiconductors, Faraday effect, theory 3=23047
semiconductors, high-field and space-charge
effects 3=13055
semiconductors, lattice vibrations 3=10576
semiconductors, low-mobility transport
phenomena 3=10738
semiconductors, neutron irradi. effects 3=25336
semiconductors, optical properties 3=10906
semiconductors, outstanding problems 3=843
semiconductors, transport, experimental, recent
developments 3=10730
semiconductors, transport theory 3=10731
shock waves, nonequilibrium phenomena 3=16695
shock waves, theory 3=18892
solar spectroscopy, rocket-borne instruments and
techniques 3=11531
solid films, reactivity rel. to irradi. 3=6896
solid solutions, b.c.c. and f.c.c., electronic specific
heat 3=8367
solids, anelastic, stress waves 3=21477
solids, vacuum u.v. optical and photoelectric effects
at Santa Barbara 3=13145
Soviet physics mathematics and astronomy 3=21185
space research 3=11608-9
space research, British work 3=7053
space technology 3=16433
spark chambers 3=17138
spectra excitation by shock waves 3=11912
spectra, molecules, polyatomic, absorpt., i.r.,
review 3=15323
spectra of solids of condensed gases 3=10929
spectral excitation by ion bombardment 3=9594
spectral-line narrowing meths., rel. to length
meas. 3=24037
spectrochemical analysis, theory, plasma. 3=25841
spectroscopy, extreme u.v. 3=14337
spectroscopy, i.r., 1-5 μ , range, precision 3=248
spectroscopy, microwave 3=21981
spectroscopy, vacuum u.v., recent advances 3=7325
spin-spin relaxation, recent developments 3=1196
sputtering 3=7653
stars, evolution 3=21114
strain measurement, modern techniques 3=7170
superconducting magnets 3=17028
superconductivity, BCS theory 3=12025
superconductors, high-field 3=12021
surface diffusion 3=17780
telescopes, refracting, objectives design 3=9141
thermometers, calibration, fixed point 3=24089
thermonuclear reactions, controlled 3=22442
3-dimensional turbulent boundary layers 3=21299
transition metals, electron theory 3=17676
transuranic elements 3=4284
tunnel diodes, h.f. applications 3=15604
turbulence meas. by anemometers, hot wire 3=18840
u.v. radiation physics in astron. and geophysics 3=9187
ultra-high vacuum technology (in Japanese). 3=179
ultrasonic wave absorption in paramagnetic
materials 3=20097
ultrasonics applications 3=9565
ultrasonics applied to solid state 3=10594
ultrasonics, microwave (1-24 Gc/s), in solids 3=6470
units, current and resistance, elec., pot., Faraday const.,
proton gyromag. ratio, meas. 3=21189
universe, development of knowledge, 20th century 3=25966
vacuum demountable seats and heat-resist. valves 3=14230
Van Allen particle motion and energy spectra 3=23642
vapour pressure of isotopic mols. 3=21631
Vavilov-Cherenkov, radiation 3=24685
viscometers 3=14113
viscosity, liquids 3=14112
vision, discrim. functions, neural effects 3=5300
vision, retinal image formation, optics 3=5293

Reviews—contd

- visual discrimination and orientation 3=16457
 wavelength meas. in vacuum u.v. 3=21538
 X-ray crystallography of biologically important macro-
 molecules 3=23438
 X-ray fluorescence spectroscopy 3=16185
 X-ray spectroscopic analysis with radioisotopes 3=16186
 TiO₂, rutile, photoconductivity, polarization, and space-
 charge-limited currents 3=17963
 U, its alloys and cpds., self- and heterodiffusion 3=8454
 U, $\alpha=\beta$ phase transition mechanisms 3=5129

Rhenium

- de Haas—van Alphen oscills., mechanism 3=23137
 desorption of Cs⁺ and Ba⁺ 3=8930
 films, on Si, polarized thermal light emission 3=17980
 magnetoelectric effects in fields up to 180 kOe,
 at 4.2°K 3=4909
 superconductivity, change of transition temp.
 with press. 3=14461
 thermal desorption of adsorbed Th 3=21856
 thermionic emission, in Cs vapour, low coverage,
 discontinuity 3=14624-5
 work function, effect of adsorbed Th 3=21856

Rhenium compounds

- Re—Al phase diagram, new phase ReAl₄ 3=20882
 Re—Al (36.5–99.92 at.%), crystal lattice spacings 3=18339
 ReAl₆, unit cell meas. 3=5115
 ReBe₂₂, crystal structure 3=20839
 ReF₆, rotl. Raman spectrum, Rayleigh scatt.
 depolarization 3=2623
 Re—Mo alloys, 2 σ -phase, atomic order, from powder
 photographs and X-ray diffr. 3=25752
 ReSi₃, prepn., props. of new semiconductor 3=872
 Re—W for rotating anodes 3=17014

Rheology

- See also Plasticity; Viscoelasticity.
 Bingham fluid behaviour in cone-and-plate
 viscometer 3=14114
 constitutive derivative in tensor fields 3=14074
 non-linear problems, dimensional analysis 3=23843
 polymers, solid, math. theory 3=18366
 rheological eqn. of state, conditions for
 application 3=8774
 rubber viscosity theory, integrals 3=11166
 surface wave atten. on half-space 3=14240
 thermodynamic theory 3=1658
 viscoelastic liquid, helical flow, single relaxation
 time 3=18789

Rhodium

- field emission, from single crystal tips, obs. by micro-
 scope 3=12233
 thermocouples with noble metals, instability 3=1861
 vaporization, heat of, at 298°K 3=1876

Rhodium compounds

- Pt in Rh, solid solutions, optical constants, 0.01–
 1.5 at.%Pt 3=13153
 Rh pentamminebromo complex, Br⁸⁰m decay
 effects 3=23553
 RhF₄, i.r. spectrum 3=12839
 Rh—Fe alloy, crystalline and magnetic structures 3=3320
 Rh₁₇S₁₆, crystal structure 3=8841
 Rh—Ti alloys, superconducting transition temp. 3=21669
 Rh—Zr alloys, superconducting transition temp. 3=21669

Rochelle salt

- dielectric permittivity, rel. to applied elec. fld. 3=23001
 dielectric properties, ultra-high frequencies 3=20385
 e.m. and sound waves, interaction 3=2949
 e.s.r. study, rel. to irradiation 3=20654
 electrostriction 3=13121
 ferroelec. domain walls in sudarés 3=2959
 ferroelec. structure, neutron diffraction study 3=899
 n.m.r. of Na²³, ang. depend., quadrupole shifts,
 second order 3=25594
 nuclear magnetic double resonance 3=25593
 radiation damage effects on ferroelec. and mech.
 props. 3=10883
 Raman spectrum, H bond, para-ferroelectric transition
 mechanism 3=20484
 sound absorpt. near upper Curie pt., frequency
 depend. 3=2726

Rochelle salt — contd

- Cu²⁺ doped, effect on "delayed phenomena" 3=25404

Rock magnetism

- apparatus, new magnetometer 3=9905
 basalt in hole EM 7, Mohole project 3=9137
 basalts, from Victoria (Australia), magnetization
 stability 3=1495
 Britain, Devonian, revised 3=16309
 chlorophaeite, effects of heating 3=1499
 data rel. to geomag. field in remote times 3=1484
 demagnetizing factor rel. to magnetization and
 susceptibility 3=11064
 and earth rotation, fossil 3=11465
 electrical properties, equiv. cct.determ. 3=19135
 and evolution of earth-moon system 3=9136
 ferromagnetic composition, a.c. field detm.
 method 3=13847
 Great Dyke, S.Rhodesia, palaeomag. 3=11480
 haematite—ilmenite solid solns., magnetization 3=3523
 hematitic body, massive, mag. characteristics 3=1494
 igneous and metamorphic, susceptibility anisotropy 3=1493
 magnetic permeability, equiv. cct.determ. 3=19135
 magnetite and hematite, mag. props. 3=13845
 magnetite, mag. transformation and domain
 structure 3=9138
 meas., astatic magnetometer, optimum sample
 size 3=12287
 mesozoic rocks of Eastern Australia 3=18578–82
 plutons, granitic, Upper Cretaceous, California 3=18577
 pressure effects, unidirectional, meas. 3=1498
 remanent moment, temp. var. meas. 3=14708
 self-reversal in synthetic ilmenite—hematite solid
 solutions 3=18576
 self-reversed and field-reversed rocks,
 distinguishability 3=3522
 serpentine from Sierra Nevada, remanent, induced and
 total magnetism 3=11476
 single-component specimens, thermomagnetization
 characteristics 3=13846
 small, randomly directed moments in demag.
 rocks 3=13848
 susceptibility anisotropy 3=11477
 susceptibility, total and anisotropic, meas. 3=14718
 tabular bodies, long, mag. anomalies, interpretation,
 standard curves 3=16310
 thermochemical remanent magnetization 3=11479
 thermoremanence, single to multi-domain trans-
 itions 3=5228
 thermoremanent magnetization, inversed-type,
 production 3=11065
 Welsh slates, susceptibility anisotropy rel. to bulk
 susceptibility 3=11478
 FeO—Fe₂O₃—TiO₂, mag. props. 3=1497
 FeTiO₃—Fe₂O₃, reverse thermoremanent
 magnetization 3=1496

Rockets

- acoustic properties, liquid and solid-propellant
 rockets 3=11864
 Astrobee 200, ionosphere meas. instruments 3=5213
 atmosphere, upper, densities, ion, electron, neutral,
 obs., review. 3=25916
 ballistics for large-range missiles 3=1544
 charge particle traps on Soviet rockets 3=3539
 combustion chambers, relaxation oscillations
 in gas phase 3=1389
 engine-noise data at launching 3=16438
 ideal fuel, pressure—temp. curve 3=1546
 ionospheric electric field intensity on surface 3=3487
 Jason, high-altitude electron meas. rel. to nuclear
 detonations 3=9114
 magnetohydrodynamic propulsion, interplanetary 3=19424
 motors, acoustic instability 3=7287
 noise meas. with microphones, vibr. effects 3=14282
 propellant optimization, computer analogue 3=16470
 reactor performances for propulsion 3=16434
 Soviet, brief data 3=21136
 Soviet, general data 3=3630
 specific impulse and performance 3=1545
 spectrometers, grating, solar 3=11615
 sun spectra obs., resonance, He II 304 Å and
 He I 584 Å 3=11534

Rockets—contd

- tracking systems, optical and i.r. 3=18666
- trajectories, optimum, max. range and min. time 3=11614
- trajectories, optimum thrust 3=3778
- for wind study, night, upper atmosphere, chemiluminescence payloads. 3=25918

Rotating bodies

- See also Angular velocity measurement; Centrifuges; Earth, rotation; Gyroscopes.
 - angular momentum conserv., demonstr. apparatus 3=3703
 - beam, whirling Rayleigh type, vibs. 3=18879
 - beam with tip mass 3=18878
 - disk, edge velo., and special relativity 3=9336
 - fluid mass, grav. field 3=1600
 - gravitation, Einstein field, sphere 3=16503
 - liquid column, stability 3=1666
 - liquid, oscillations, slow forcing region, travelling-wave disturbances 3=18792
 - n.m.r. rel. to spin diffusion 3=6762
 - oscillations and stability of rotating gaseous masses 3=3591-2
 - shells of revolution, supported on an elastic body 3=9387
 - sphere, in fluid, non-Newtonian, boundary layer, laminar 3=9409
 - sphere, in non-Newtonian viscous liquid 3=111
 - PCl_5 , n.m.r. spin-lattice relax. and rotat. freq. 3=20683
- Rotatory power, dispersion.**
See Optical rotation.

Rubber

- crystallinity, strain-induced, electron microscopy 3=18427
- crystallization kinetics, hydrostatic press. depend. 3=23421
- deformation, shear and tension, theory and expt. 3=15972
- elastic relaxation, automatic meas. 3=13339
- elastic wave propag., finite, in filaments 3=7270
- electrets, on vulcanization, time var. for different fields 3=25409
- etching, for filler electron microscope examination 3=23528
- films, natural, spherulite morphology 3=1343
- friction, var. temps. and velos., relation to visco-elasticity 3=18013
- latex, particle size distrib. meas. 3=6931
- mechanical damping, representation 3=18877
- molecular motion, n.m.r. study 3=11125
- natural, 1000 Å-thick films, spherulite morphology 3=20919
- piezoelectricity, on vulcanization 3=25409
- polyurethane, rheology, math. theory 3=18366
- pressure-induced transitions 3=23494
- rubber hydrochloride, stress relaxation 3=1133
- rubber-like polymers, viscoelastic behaviour 3=11167
- silicone rubber, X-ray diffrn. from lattice planes 3=3349
- tearing process, molecular mechanism 3=5074
- various objects, simple prod. technique 3=13980
- viscosity theory, integrals 3=11166

Rubidium

- atoms, polarized, mag. relaxation at paraffin-covered walls 3=25060
- atoms, spin relaxation induced by H_2 and rare gases 3=4723
- de Haas-van Alphen effect 3=1122
- ion, scatt. process by Mo metal 3=22854
- ions, Rb^+ , scattering on hot Mo 3=2047
- ions, Rb^{86} , range in Al 3=12608
- liquid, heat capacity calc. up to 800°C 3=23870
- optical pumping, disorientation cross-sections 3=8200
- spectrum, pressure effects, Ar 3=22488
- thermoelectricity, electron and phonon scatt. 3=23027
- vacuum deposition 3=11844

Rubidium compounds

- halides, diffusion of Kr, prod. by n irradi. 3=15508
- Rb cyanoplatinate, as γ -scintillator 3=6668
- Rb halides, aqueous solns., u.s. behaviour 3=16623
- Rb halides, sp. ht. rel. to spectroscopic behaviour 3=765
- RbBeF_3 , crystal structure, atomic 3=20847
- RbBe_2F_7 , crystal structure rel. to silicate sheets 3=13484
- α - RbBi_2 , crystal structure 3=13518

Rubidium compounds — contd

- RbBr , F-centres, e.s.r. and ENDOR 3=15520
- RbBr moving edge dislocations 3=10654
- RbCl , decomposition by electron irradi. 3=17809
- RbCl , exoelectron emission spectrum 3=14618
- RbCl , F-centres, e.s.r. and ENDOR 3=15520
- RbCl , K-absorpt. spectrum of Cl 3=6660
- RbCl-KBr mixtures, colour centres 3=10693
- RbClO_3 , X-ray K-absorpt. spectra of Cl 3=23090
- RbClO_4 , X-ray K-absorpt. spectra of Cl 3=20498
- RbF , transformation f.c.c. to CsCl -type, 9-15 kbar 3=5077
- RbH , spectra, Franck-Condon factors and r-centroids 3=4757
- RbI , moving edge dislocations 3=10654
- Rb-K alloys, liquid, thermoelectric power 3=145
- RbMnF_2 , antiferromagnetism and antiferromag. resonance 3=3144
- RbMnF_3 , antiferromagnetic resonance 3=18123
- RbMnF_3 , cubic, antiferromag. resonance 3=15928
- RbNO_3 , fused, transport numbers 3=16172
- RbNO_3 , thermal phase transformations 3=1252
- RbPF_6 , specific heat and phase transitions 3=12927
- RbSb_2 , crystal structure 3=13518

Ruthenium

- superconducting, absence of isotope effect 3=3963
- superconductive temp. controller, below 1°K 3=1880
- Ru^{103} film on fallout particles 3=10280
- Ru^{103} - Ru^{106} pair, analysis by β - γ coincidences 3=5990

Ruthenium compounds

- superconductivity 3=24148
- $\text{Ru}_2\text{Be}_{17}$, crystal structure 3=8839
- RuF_6 , i.r. spectrum 3=12839

S-matrix theory

- See also Dispersion relations.
- analytic props. rel. to causality requirements 3=24633
- analyticity in coupling const., ang. momentum and energy 3=19581
- asymptotic behaviour, analytic continuation in ang. mom. 3=12418
- asymptotic behaviour in potl. scatt. 3=14909
- asymptotic behaviour for small ang. momentum 3=10055
- behaviour of zero coupling constant 3=12410
- Borcher's second theorem, deduced from complete asymptotic states hypothesis 3=24645
- bounds on matrix elements, complex systems 3=22083
- complex ang. momentum in many-channel scatt. 3=7789
- construction without divergent quantities 3=12401
- coupled two-particle channels, resonances 3=10040
- coupling const. restriction by analyticity and unitarity 3=10062
- crossed channels, complex ang. momenta and unitarity 3=5949
- crossing relns. for arbitrary processes 3=10058
- derivation from particle description in qu. field theory 3=2189
- deuterons stripping, by reduction techniques 3=15223
- Dyson S-matrix, definition, arbitrariness 3=12407
- forced harmonic oscillator, S-matrix solution 3=14032
- formfactor satisfying unitarity condition 3=14922
- functional formalism of the S-matrix 3=24646
- impulse approximation, general discussion 3=5948
- invariance 3=12421
- invariant amplitudes, for arb. spins and nonzero masses 3=10059
- isotropic spin indep. in high energy limit 3=7808
- Jost function, generalized, rel. to Levinson reln. 3=10061
- Landau surface on phys. sheet, singularities criterion 3=5941
- Levinson's theorem, derivation and props. 3=24663
- Levinson's theorem, relativistic extension 3=19578
- Mandelstam's programme in potential scatt. 3=10039
- meson prod., multiple, fire-ball model 3=22156
- multichannel, real unitary represent. for complex l and E 3=21245
- N-N scatt., Mandelstam represent., strip approx. 3=7842
- nonrelativistic quantum mech., rotational invariance 3=10058

S-matrix theory—contd

- nucleon-nucleon diffr. scatt., unitarity 3=4384
- parity, intrinsic 3=2218
- phase shift, momentum depend. bound 3=7807
- π -N, $I = \frac{1}{2}$, $J = \frac{1}{2}$ state 3=2314
- π - π amplitudes from boundary condition model 3=19676
- poles, for complex ang. momentum 3=14907
- reduction of elements and retarded functions 3=17204
- Regge poles with complex singularities 3=22090
- Regge poles and Rosenbluth formula validity 3=2207
- Regge poles, threshold motion 3=14915
- Regge trajectories for square-well potential 3=2223
- relativistic, analyticity in ang. momentum 3=2217
- representation in terms of ang. momentum poles 3=7804
- review 3=24643
- S- and F matrix zeros in two static models 3=7790
- S-matrix construction, problem 3=24644
- scatt. amplitudes with complex singularities 3=19558
- scattering amplitude, relativistic, asymptotic Regge behaviour, and scale transformation 3=12429
- for Schrödinger equation, one-dimensional, rel. to quasi-classical region 3=7791
- self-consistent matrix with Regge asymptotic behaviour 3=10047
- singularities in ang. momentum plane 3=10054
- soluble field theory 3=5331
- spatial separation of events, derivation 3=23767
- spin $\frac{1}{2}$ particles, ang. momentum poles 3=7803
- stochastic, prelim. definition with probability conservation 3=7792
- strip approx., N/D eqns., artificial singularity 3=12425
- T-matrix regularity in Dirac potential scatt. 3=21246
- TCP invariance, interpolation of S-matrix 3=12408
- trajectories of poles in l plane 3=2213
- two-particle resonances, in unphysical sheet 3=12483
- unitarity and causality with unstable particles 3=10014
- unitarity, scatt., pion-nucleon 3=5944
- unstable particles 3=19567
- unstable particles, poles and thresholds 3=12394
- Wick decomposition formalism for quant. electro-dyn. 3=7766

Samarium

- antiferromagnetism at $\sim 0.15^\circ\text{K}$ 3=2468
- spectrum, visible, rel. to 4f shell transitions 3=13182
- Sm^{2+} spectra, in alkali halide crystals, absorpt., 300, 77°K , luminescence 3=23079
- Sm^{2+} , i.r. absorption spectra in soln. 3=9462
- Sm^{3+} levels in LaCl_3 , crystal-field splitting 3=2692
- Sm^{149} abundance in meteorites 3=13875

Samarium compounds

- SmAl_2 , Al Knight shift 3=1159
- SmAl_2 , mag. moment and Curie pt. 3=991
- SmCl_3 , absorption and fluorescence spectra 3=3016
- Sm^{149} double nitrate, mag. cooling, nuclear polarization 3=2468
- Sm^{149} ethyl sulphate, mag. cooling, nuclear polarization 3=2468
- SmFe garnet, exchange fields 3=1159
- SmFe garnet, far i.r. absorption spectrum 3=15680
- SmH_x ($x = 1.99 - 2.88$), mag. props., variation with temp 3=15744
- Sm_2O_3 , specific heat and thermodyn. props 3=20105
- Sm^{140}O , Mössbauer effect 3=6459
- SmR , (R is organic radical), for possible maser, optical, by internal energy transfer 3=17072

Sampling

See Statistical analysis.

Sand

- ripples in the desert 3=1421
- water-filled, acoustic props. 3=23987

Satellites, artificial

- aerial, ionospheric meas., 700-1000 km, 54°N - 54°S 3=9092
- Alouette, ionosphere investigation 3=11431
- Alouette, ionosphere top-side soundings 3=13732-4
- Alouette, study of artificial radiation zones 3=23635
- analogy with gyroscopes 3=16320
- atmosphere, upper, densities, ion, electron, neutral, obs., review. 3=25916
- circuitry for ionospheric F_2 charge density direct meas. 3=13767

Satellites, artificial — contd

- cosmic radio noise obs., use of Z-mode propag. 3=1537
- dynamics, orbital and attitude motions 3=16433
- Echo I, photographic posns. 3=13938
- electric field neighbouring, calc. 3=21137
- electrostatic drag, controversy discussion 3=11612
- Explorer I, deceleration 1958-62, effect of solar wind 3=9068
- Explorer II, orientation, radio meas. 3=23716
- Explorer 9, optical observations, atmospheric drag 3=3631
- Explorer XI, γ -ray data, prelim. report 3=617
- geophysical orbiting observations 3=5176
- interplanetary matter, > 33 keV, and E-region irregularities 3=11437
- ionosphere, electron content, from simultaneous Faraday fading rate and differential Doppler shift 3=11434
- ionosphere, "topside" obs., v.l.f., whistlers and noise 3=21056
- libration of circular orbital plane 3=11611
- lifetime, calc. 3=7057
- Mariner II, high-energy radiation meas., Sept.-Oct., 1962 3=22231
- Mariner II, solar plasma expt. 3=7028
- meteorological measurements, use 3=5189
- meteorological studies, non-Russian, review 3=18492
- Midas 3, optical observations 3=3631
- needles, West Ford, collisions with micro-meteorites 3=25994
- nightglow observations 3=11445
- 1958 δ 2 (Sputnik III), 40 Mc/s transmission, Faraday effect and ionosphere, electron content 3=16272
- 1958 ϵ , Explorer 4, radiation-belt trapped particles meas. 3=9111
- 1959 δ 2 (Explorer 6), l.f. magnetohydrodynamic wave obs. 3=9127
- 1959 η , (Vanguard 3), geomag. fld. obs. 3=9125
- 1961 $\alpha\eta$, Traac, artificial radiation belt obs., July 9, 1962 3=16287
- 1961 $\alpha\eta$, Traac, July 9, 1962, 2nd artificial radiation belt obs. 3=16289
- 1961k, Explorer 10, earth's magnetic field meas. 3=11466
- 1961k Explorer 10, plasma meas. 3=25993
- 1961 ν (Explorer 12) cosmic ray meas. rel. to SSC, 30 Sept. 1961 3=7955
- 1961 ν (Explorer 12) cosmic-ray proton meas. 3=7954
- 1961 ν (Explorer 12) galactic and solar proton meas. 28 Sept. 3=7953
- 1961 ω [Injun 1] solar protons at 881-998 km 3=7952
- 1961 σ , Injun, Geiger counter efficiency 3=16438
- 1961 σ , Injun 1, artificial radiation belt. meas. 3=13809
- 1962 α , ϵ , Telstar, artificial radiation belt meas. 3=13808
- 1962, MA-6 Mercury; radio echoes during re-entry 3=11613
- 1962, Sept 1 to 5, artificial radiation belt. meas. 3=16285
- observations in Finland 3=7055
- observations 1959-60, conference 3=9139
- orbit dynamics, guide to literature 3=11610
- orbit evolution under action of external bodies 3=3629
- orbit perturbation by extra-terrestrial grav. 3=3628
- orbiting dipoles, charge drag, exptl. study 3=18664
- orbiting solar observatory, instruments 3=9286
- orbits, contraction, under influence of air drag 3=25992
- orbits, rel. to atm. density scale height 3=3480
- orbits, resonance behaviour calc. 3=9284
- orbits, use of two fixed centres theory 3=16437
- photographic study, time recording method 3=21142
- photography, with 125 mm Schmidt camera 3=9285
- radio interferometer, tracking, three base-line 3=18648
- radio, scintillations, variation with zenith angle 3=21124
- radio signals scintillation, and E-region irregularities, vertical distrib. 3=11437
- radio transmission through ionosph. irregularities 3=514
- radio transmissions, Doppler shift, earth mag. field effect 3=6997

Satellites, artificial — contd

- re-entry problems 3=16433
- review, rel. to atmosphere and electrons 3=25990
- signal scintillation, ionospheric effects 3=13714-5
- Soviet, brief data 3=21136
- Soviet, general data 3=3630
- stability in two immovable centres earth approx. 3=21084
- sun, radiation pressure, orbital effects 3=23715
- telecommunication uses 3=16433
- topside, ionization obs., field aligned, low latitude 3=25926
- top-side, ionosphere, electron density soundings 3=16245
- tracking, accurate, using radio Doppler effect 3=3632
- tracking methods, review 3=21141
- 24 hour, perturbed motion due to ellipticity 3=18665
- 24 hr, resonance orbits 3=13939
- UK1 (Ariel, 1962 o), solar X-ray emission data 3=16388
- UK1 (Ariel, 1962 o), upper atm. electron density data 3=16236
- UK1 (Ariel, 1962 o), upper atm. ionization data 3=16235
- UK 1, research programme 3=1547
- use for meas. of atmosph. i.r. cooling 3=1444

Scandium

- atom, Sc⁴⁺, h.f.s. 3=2361
- mag. susceptibility, 100° to 1000°K 3=25508
- positron mean life, meas. 3=17695
- resistivity, 1.38°-358.8°K 3=10722
- vapour pressure 3=24119

Scandium compounds

- ScF₃, spectrum, electronic 3=17583
- Sc₂Ge₃, crystal structure 3=8842
- Sc₂O₃-Ga₂O₃ system, phase equil. relns. 3=12001
- Sc₂O(SiO₄), diagram of state, melting points, densities and optical props. 3=13485
- ScP, crystal structure 3=11258
- Sc₂Si, crystal structure 3=8842
- Sc₂Si₂O₇, digram of state, melting points, densities and optical props. 3=13485

Scattering

- amplitude, asymptotic behaviour rel. to partial waves with complex orbital momenta 3=4357
- atomic systems, resonance, theory 3=6368
- backscatter from inhomogeneous media 3=11676
- Born expansion, optimization 3=11699
- bound states embedded in continuum and formal theory 3=14900
- central potential scattering, Brysk and determinantal approxs. 3=11702
- Coulomb field, phases and amplitudes 3=9346
- Coulomb Green's function, nonrelativistic 3=11701
- distorted-wave approx. for phase shifts 3=17198
- hard core due to orthogonality constraints 3=5364
- inverse problem in quantum theory 3=7123
- Lippmann-Schwinger eqns., field of validity 3=21243
- Mandelstam representation, quasipotential character 3=19560
- molecular beams, rainbow effect 3=6439
- multiple, mean spatial and projected angles, theory 3=17211
- partial wave amplitude, essential singularity 3=22077
- plane waves at apertures in plane screen 3=17
- potential, "invariant imbedding" techniques 3=11700
- potential, phase shifts and bound state energies 3=7124
- quantum-mechanical, wave packet theory 3=3755
- radiation, statistical geometric basis 3=14041
- recurrence relations, calc. of radial part of ang. momentum matrix 3=3756
- Riccati eqn., application 3=11662
- scattering operator, existence 3=16536
- Schrödinger's eqn. solution, with holomorphic potential function quasi-classical approx. 3=23763
- singularities in the left half-plane 3=24628
- small-angle critical scatt. from cooperative assemblies 3=52
- spheres and cylinders, poles, Hankel function zeros 3=17053
- treatment of exchange 3=19566
- vector wave eqn., variational princs. 3=17056
- wave function, quantum, one-centre expansion 3=3758
- waves, fluctuating, by large objects 3=18703

Scattering — contd

- Al, inelastic : elastic scattering cross section ratio 3=20974
- Au, by Kr⁺, 10-1000 eV, energy, by calorimetry 3=5724
- C, inelastic : elastic scattering cross-section ratio 3=20974
- Cr, inelastic : elastic scattering cross-section ratio 3=20974
- Ge, inelastic : elastic scattering cross-section ratio 3=20974
- H atoms, on nuclei 3=4701
- Pd, inelastic : elastic scattering cross-section ratio 3=20974
- Pt, inelastic : elastic scattering cross-section ratio 3=20974
- acoustic waves**
 - atmospheric turbulent media, theory. 3=25915
 - clusters of discrete inhomogeneities, coherent 3=14272
 - deep-sea bed backscatt. of explosive sound 3=3444
 - echo formation, rigid body in fluid, optical anal., errata 3=5501
 - elastic prolate spheroid 3=11867
 - by fish models, ellipsoids 3=1775
 - lattice, resonance, by isotopes, theory 3=10595
 - in ocean, deep. 3=25862
 - by ocean surface and bottom 3=16202
 - periodically uneven near-sawtooth surface 3=16711
 - phase lattices, meas. 3=5499
 - pulses, by thin-walled metallic cylinder in water 3=5500
 - in reverberation chamber, 125-500 c/s, sound distribn. 3=1776
 - Rijke phenomenon, small-signal analysis 3=18933
 - rough surface analysis 3=18374
 - rough surface, with two irregularity types 3=14273
 - sea surface 3=9559
 - sea surface, rel. to its roughness 3=1423
 - by sea surface and sea bed 3=21568
 - turbulent medium, nonisotropic 3=23986
 - underwater scatt. from liquid sphere 3=11794
 - NaCl, by impurity ions, rel. to thermal cond. 3=6473
- acoustic waves, ultrasonic**
 - in liquids, by bodies of low shear modulus 3=18931
 - steel, SAF 4150, attenuation, Rayleigh scatt. 3=10590
 - U and grains, unrefined, detection, pulses 3=13496
- electromagnetic waves**
 - aurorae, alternative processes 3=11587
 - auroral ionosphere, multiple scatt. by irregularities 3=13716
 - backscatter, identical vanishing conditions 3=17055
 - by bounded plasma 3=9790
 - conducting sphere in dissipative medium 3=407
 - conductor in semi-inf. dissipative medium, backscatt. 3=21976
 - crystals, Rayleigh, and excitons 3=17989
 - by cylinder coated with inhomog. plasma sheath 3=7703
 - cylindrical surface, effect of discontinuity 3=7706
 - dielectric, backscatter theory 3=11676
 - dielectric-coated metallic cylinder, calc. 3=9933
 - dielectric interface, sinusoidal, Luneberg-Kline analysis 3=7704
 - dispersions, spheres 3=19447
 - electrons, free, into half original wavelength 3=24437
 - by electrons, high energy 3=17057-8
 - electrons in ionosphere, incoherent backscatter 3=13772
 - fluctuating medium, statistical theory 3=21973
 - grating of circular cylinders, infinite 3=7705
 - ground-backscatter, high-freq. rel to solar flare 3=507
 - ice spheres in atmosphere, backscattering 3=9041
 - ice spheroids, oblate, back-scatter meas. 3=9934
 - incoherent by free electrons 3=7702
 - infinite metal rod, elliptical, calc. 3=17052
 - inverse scatt. problem 3=7123
 - by ionized gas, electron distrib. det. 3=4136
 - ionosphere, backscatter, incoherent 440Mc/s, May 1961 3=7720
 - and ionosphere, F-region, temp. vars., 200-700 km 3=11443
 - ionosphere propag., long-distance 3=19461
 - by ionospheric plasma 3=16244

Scattering—contd**electromagnetic waves—contd**

- by ions, appl. to ionosphere 3=6975
- by large objects 3=18703
- lunar surface, back-scatt., diffr. theory 3=1512
- moon, Senior—Seigel theory 3=9263
- in medium filling half of three-dimensional space 3=5848
- by meteor trails 3=7049
- on meteor trails 3=19448
- by meteor trails, attenuation function 3=25984
- meteor trails, Eshleman's model modification 3=23709
- meteor trails, ionized columns, theory 3=11587
- meteor trails, radio echo, asymm. model 3=11599
- microwave aerial in hollow dielec. wedge 3=12317
- microwave, from unstable plasma waves 3=4168
- moon 3=11587
- periodic structures, multiple scattering 3=7697
- plasma, bounded column, plane wave 3=9791
- plasma columns, small-dia. 3=21785
- by plasma, harmonics predicted 3=232
- plasma, including collisions, calc. 3=16942
- plasma, inhomogen., and conversion cross-sections 3=499
- plasma, peaks, minor, microwaves, and e density meas. 3=19254
- plasma wave instabilities, directional effect 3=415
- potential, variational principles 3=17056
- radially inhomog. spherical medium, dyadic Green's function 3=24467
- radiation intensity in interior of scattering and absorbing medium, theory 3=12314
- radiation transfer eqn. for aspherical indicatrix 3=7696
- Raman scatt., stimulated, from lattice vibs. 3=23060
- by small particles, polarization 3=14772
- sphere, coated by large complex refr. index 3=498
- spheres and cylinders, poles, Hankel function zeros 3=17053
- spherical earth, focusing effects 3=12323
- spherical particles, inhomog. waves 3=17054
- tropospheric inhomogeneities experimental technique 3=13687
- in turbulent medium, without assuming small perturbations 3=12315
- uneven surfaces, Fraunhofer zone 3=21975
- unidirectional surface waves, at cond. screen 3=21974
- v.h.f., at aurorae, data analysis 3=9080

light

- See also Diffusion, light; Raman spectra.
- aerosol drops and granularity meas. 3=21009
- by aggregates, suspended in a liquid 3=5531
- n-alcohols, Rayleigh line-width, orientational relax. times 3=21366
- alkali halides, spectral shifts 3=762-5
- alkyl bromides, Rayleigh line-width, orientational relax. times 3=21366
- atmosphere, lower, nephelometry 3=6963
- atoms, redistrib. functions with Doppler broadening 3=7358
- by benzene, const. 3=7208
- collidine-water solns., conc. fluctuations study 3=21365
- colloidal spheres, scatt. ratio meas. 3=5530
- in copolymer, sequence, study 3=18443
- crystal impurity centres 3=20464
- crystals, cubic, for Raman effect 3=23059
- crystals, Raman resonance scattering 3=3024
- dispersions, spheres 3=19447
- electric fields, polar molecule meas. possibility 3=24059
- by electron beam, from ruby laser 3=16803
- by electrons, captured in Van Allen belts 3=6996
- by free electrons, harmonics predicted 3=232
- gas, in inhomogeneous elec. field, intensity eqn. 3=23931
- gases, nonlinear, in elec. or mag. field 3=11834
- gases, Rayleigh, for u.v. refr. index meas. 3=14215
- glasses, depolarization, rel. to elastic strains 3=921
- group integrals appl. 3=14367
- haloes, models, for scatt. by spherical droplets 3=21567
- hexamethylenimine-water solns., conc. fluctuations study 3=21365
- interplanetary matter, phase law 3=3542

Scattering—contd**light—contd**

- laser radiation, coherent source pattern 3=14372
- liquid, turbid, coherent light, granularity 3=19025
- liquids, asymm. and symm. top molecules 3=7209
- liquids, fine structure, diffraction by elastic thermal waves view 3=18814
- liquids, mixtures, binary, organic, Rayleigh const. 3=5442
- in liquids, organic, dipole orientation relaxation 3=7207
- liquids, Rayleigh scatt. and molecular orientation 3=21369
- liquids, rel. to rotational diffusion in molecules 3=15329
- liquids, viscous, depolarization factor and absorption, acoustic waves 3=21360
- macromolecules, flowing, depolarization 3=14165
- macromolecules, flowing, interference factor 3=14164
- macromolecules, flowing, two-particle correl. 3=14163
- magnetic fields, polar molecule meas. possibility 3=24059
- meas., submersible meter, for seawater, design theory 3=19023
- in medium of finite optical thickness, anisotropic 3=7357
- metal wires, thin, rel. to plasma props. 3=13159
- metals, i.r., electron surface collisions theory 3=25245
- by meteoric particles, density distrib. 3=7023
- methane, Raman line broadening at 15-250 atm. 3=176
- methane, Rayleigh scatt., depolarization. 3=175
- microinhomogeneous media, anomalous, model 3=9624
- mirrors, dielectric, maser, optical 3=16805
- by multi-component systems 3=23882
- multiple, in absorbing medium 3=11941
- nitrobenzol, soln. in n-heptane, absolute coeff. 3=21367
- non-coherent, resolvent of auxiliary eqn. 3=3893
- nonlinear optical phenomena calc. 3=14371
- non-spherical particles, 3 cm wave scatt. functions 3=4275
- in nonsteady state medium 3=82
- paraffins, normal, and dilute solns., anisotropy 3=136
- n-paraffins, Rayleigh line-width, orientational relax. times 3=21366
- in phase separations, diffusion-controlled 3=16802
- at phase transformations, second order, ferro-electric 3=20450
- in photographic emulsion, effect on blackening 3=11956
- β -picoline-water solns., conc. fluctuations study 3=21365
- plasma, θ -pinch, using maser, optical, ruby 3=19256
- plates and lenses, flare meas. method 3=16801
- polyethylene, scattering under dynamic conditions 3=10914
- rel. to polymers, structure 3=16127
- polymers, theory 3=9623
- polymethylmethacrylate, dilute solns. 3=134
- polystyrene, soln. in cyclohexane, temp. var. 3=9459
- radiation, in homog. sphere with central source 3=19061
- Raman scatt., stimulated, of giant laser pulse 3=21569
- Raman, stimulated, gain theory 3=14374
- Rayleigh, by liquids, theory 3=14166
- Rayleigh, from thin layer, polarization effects 3=1835
- resonance, in image-forming filter 3=16780
- rock salt, optical density spectral distrib., rel. to plastic deformation 3=17988
- seawater, meas., submersible meter, design theory 3=19023
- silica, vitreous, depolarization, rel. to elastic strains 3=921
- solutions, Rayleigh scatt., meas. in region of critical opalescence 3=21367
- solutions, Rayleigh scatt., microstructure parameters 3=21364
- spectra in the sea-depths 3=9011
- spheres, heterogeneous, theory 3=9623
- spherical particles, highly absorbing 3=14370
- in stratiform cloud 3=9043
- by surface, nearly-polished, ang. depend. 3=21568
- suspensions of large coloured particles, interaction with absorption 3=9621
- by systems of spherical particles 3=11939
- triethylamine-water solns., conc. fluctuations study 3=21365
- turbid medium, anisotropic, in plane layers 3=14369

Scattering—contd

light—contd

- turbid medium, radiative transfer eqn. 3=14368
- Ag wire, meas. down to 2000 Å diam. 3=13159
- AgBr sols, Tyndall spectra, higher order 3=13629
- As Rayleigh scatt., depolarization. 3=175
- CaF₂, i.r., frequency shift 3=10942
- CsBr, Raman scatt. meas. 3=15692
- H, atomic, coherent, calc. 3=4715
- KCl single crystals, effect of defects 3=920
- MgO particles, rel. to wavelength 3=924
- NH₄Cl aerosols and cigarette smoke 3=19024
- NaCl with Ni impurity 3=20451
- NaClO₃, 100°-170°C 3=10921
- ReF₆, Rayleigh depolarization 3=2623

X-rays

See X-rays scattering.

Scattering, particles

See also Collision processes; Field theory, quantum, interactions; Fundamental particles; Nuclear forces; Nuclear reactions; Particle range; Particle tracks; S-matrix theory; and under individual particles, e.g. Alpha-rays

- acnodes and cusps and Mandelstam representation 3=19559
- adiabatic switching 3=22084
- amplitude, asymptotic behaviour, for arbitrary spin 3=12416
- amplitude, expansion in relativistic spherical functions 3=14921
- amplitude, relativistic, asymptotic Regge behaviour, and scale transformation 3=12429
- amplitudes, high energy, forward direction 3=2221
- amplitudes in perturbation theory, high-energy behaviour 3=17227-8
- amplitudes, rate of decrease, limitation, two particles 3=17223
- amplitudes table, strong interactions model 3=2192
- analytic continuation of partial-wave amplitude 3=24639
- analytic functions, double phase represent 3=24659
- analytic props. on first "unphysical" sheet 3=22078
- analyticity domain, envelope of holomorphy 3=12417
- analyticity domains, selection rules, particles of unequal masses 3=22080
- analyticity of perturb. expansions, review 3=24665
- analyticity of square diagram 3=17185
- analyticity and unitarity conditions 3=5938
- angular momentum singularities in scatt. amplitude for soluble potentials 3=2213
- antiparticle—antiparticle, rel. to two particles 3=2264
- aperture in plane screen, for const. momentum 3=17
- apertures in screen, for Picht wave function 3=1582
- on arbitrarily shaped body, by separation of variables 3=5366
- of arbitrary isotopic spin, amplitudes, crossing relations 3=12402
- asymptotic amplitude, unitarity 3=4349
- asymptotic behaviour rel. to baryon conservation 3=22058
- asymptotic props. of multiperipheral model, weak coupling approx. 3=7799
- Bethe—Salpeter eqn., partial wave 3=12405
- Bethe—Salpeter eqn., spinor, complex ang. momentum 3=22086
- Born approx. for small phase-shifts, low energies 3=12420
- Born series convergence, bound states 3=21248
- Born series, potl. for two spin $\frac{1}{2}$ particles 3=2210
- bounds, diffraction peaks, high energy 3=19584
- branch-pt. trajectories in complex ang. momentum plane 3=14908
- charge-particle collisions in mag. field 3=4253
- at collimator slit, calc. 3=5719
- complex ang. momentum, algebraic problems 3=24660
- complex l plane, separable potentials 3=14894
- complex partial waves, N/D method 3=10057
- Coulomb field, phases and amplitudes 3=9346
- Coulomb scatt. amps. in complex ang. momentum plane 3=2212
- Coulomb wavefunctions, Bessel functions expansion 3=3757
- Coulomb wave-functions, numerical tables 3=14924
- counters, scintillation, hodoscope 3=19506

Scattering, particles—contd

- crossed channels, complex ang. momenta and unitarity 3=5949
- crystals, simple, Van Hove correl. functions 3=11703
- DWBA validity range 3=19829
- diffraction processes, inelastic, at high energies 3=15189
- diffraction scattering, Pomeranchuk's theorem, extension 3=24641
- Dirac particle, by central scalar potl. 3=7770
- Dirac potential, T-matrix regularity 3=21246
- dispersion method in 2-particle approx., soln. of linear eqns. 3=5946
- double-charge exchange at high energies 3=14910
- double dispersion relation 3=14911
- dynamical equations and angular momentum 3=5365
- effective interaction radius, estimation 3=5974
- elastic, high-energy 3=5943
- elastic, high-energy, amplitude, imag. pt, sign and derivs 3=7811
- elastic scatt. amp., Regge pole depend. on l 3=2209
- elastic, strongly interacting, 2-20 BeV 3=7911
- in emulsions, multiple, from sums of second differences of trajectory arrows 3=7753
- energy moments of scatt. phase shifts 3=24634
- fermion Regge poles 3=14878
- Feynman amplitudes, high-energy behaviour 3=17212
- Feynman diagrams, high-energy behaviour 3=12414
- Feynman diagrams, high-energy behaviour 3=14901
- Feynman integrals, an inequality 3=4343
- Feynman rules for Regge particles 3=24658
- final state scatt. 3=2196
- final states, overlapping resonances effect 3=17195
- five-tail diagram, spectral representations 3=24650
- fixed-point scatterer, relativistic scattering, exact theory 3=24640
- forward amplitude, zeros and asympt. props. 3=10037
- hard core potl. scatt., ang. momentum analyticity 3=14905
- hard core simulation by velocity depend. 3=7966
- heavy ions on medium and heavy nuclei 3=15232
- high-energy behaviour of real part 3=5961
- high-energy behaviour, rel. to unitarity 3=7802
- high-energy, elastic, shrinking diffr. width verification 3=14917
- high-energy, inelastic, and unitarity 3=560
- high-energy potential scatt., phase shift 3=561
- high-energy, rel. to moving pole hypothesis 3=5960
- high-energy, relns. among total cross-sections 3=565
- highly-singular potentials, analytic props. of S-matrix 3=2206
- holomorphy domains, asymptotic forms of scatt. and partial-wave ampls. 3=10050
- hypervirial theorems, application 3=7127
- identical particles, high energy, phase shifts, rel. to conformal invariance 3=12430
- inelastic, asymptotic behaviour, relativistic theory 3=22078
- inelastic, high-energy, in renormalized strong-interaction theories 3=22067
- inelastic, interaction theory, rel. to optical model 3=625
- inelastic, peripheral model 3=10052
- inelastic, Regge poles at high energies 3=5952
- integral picture, semi-classical 3=17217-18
- integral representations for scatt. amplitudes with complex singularities 3=19558
- integration rules, rel. to gauge invariance 3=24585
- interacting, inelastic high energy collisions 3=14898
- intrinsic parities and spins, rels. between 3=14899
- isobaric resonances 3=12406
- isotopic spin of exchanged systems 3=14914
- Klein—Gordon, Coulomb scatt., higher Born approx. 3=4341
- $\lambda \Phi^4$ theory, Regge trajectory 3=24656
- Lee model, dressed particle picture 3=12383
- Levinson's theorem, relativistic extension 3=19578
- Lorentz covariant analytic functions 3=22053
- Mandelstam representation and Regge poles with absorptive energy-dependent potentials 3=2215
- Mandelstam representation, strip approxn. 3=6047
- many-body, soluble models, complex ang. mom. meas., filamentary scintillators, elastic, small ang. 3=17157

Scattering, particles—contd

meson—baryon exchange competition 3=22135
meson, scalar, pair theory, Landau singularity 3=24635
mesons by nucleons, Regge pole in u channel, contrib. 3=7809
model with fixed fermions, coupling constant 3=50
molecular beams, velocity of WKB approx. 3=8317-18
multichannel, appl. of Sawada transformation 3=19580
multichannel, Levinson theorem 3=10041
multichannel, subtraction of dispersion rels. 3=10063
multiperipheral model, diffraction scatt. 3=17222
multiperipheral model, scatt. amplitudes 3=19556
multiple, correction for energy losses 3=24667
multiple Coulomb, in nuclear emulsions 3=8063
multiple, mean spatial and projected angles, theory 3=17211
multiple, one velo. theory, infinite scatt. media 3=19589
N/D calc. of Pomeranchuk and ρ -Regge trajectories 3=15019
non-relativistic, causality and analyticity 3=24633
nonrelativistic, variational method, differential form 3=5367
non-shrinking, elastic, high energy 3=14916
nuclear, elastic—inelastic phase relation 3=17447
in nuclear emulsion, spurious 3=14843
nuclear excitation, collective, studies, review 3=22287
nuclei, average resonance parameters, R-matrix theory 3=6213
nuclei, elastic, threshold effect in optical model 3=6212
on nuclei, inelastic, double-excitation, distorted-waves theory 3=661
by nuclei, Monte Carlo study for geometrical barriers 3=12648
on nuclei, optical model in the interior 3=2425
nuclei, phase shift analysis, review 3=12650
nuclei, quasi-elastic, distortion effects 3=8064
by nucleus, black, inelastic diffrn. scatt. 3=2424
by nucleus, inelastic, optical model rel. to direct interact. theory 3=2423
by odd-mass nuclei, collective effects 3=19747
from odd-mass nuclei, oriented, deformed, elastic 3=19828
one particle production amplitudes, integral represent. 3=5942
one-photon exchange processes, radiative corrections 3=7777
optical potential ambiguities 3=22361
optical theorem, spin-depend. analogues 3=17208
overlapping resonances, using $e^+ + e^- \rightarrow \pi^+ + \pi^- + \pi^0$ 3=17246
"parity-unfavoured", forward and backward "selection rule" 3=24637
partial-wave amplitudes 3=24636
partial wave amplitudes and scatt. amplitude, asymptotic behaviour 3=5957
partial wave analysis, spinless particles 3=2208
partial wave and scatt. amplitudes 3=7801
partial wave scattering amplitudes, arbitrary ang. momentum 3=19587
particle by identical bound particle, perturb. theory 3=9353
particle—hole excitation effects 3=22360
particle posns. introd. into relativistic quantum mechanics 3=7797
perturbation theory at high energy 3=17209
perturbation theory, use of quasiparticles 3=17194
phase represent. of analytic functions 3=14895
phase shift ambiguity, generalization, helicity 3=22075
phase shift, derivation of new series 3=16537
phase shift, momentum depend. bound 3=7807
phase shifts, extension of Born approx. 3=14906
phase-shifts for long-range potls. 3=7793
phase shifts, variational principle 3=7800
 π -nucleon, amplitude zeros rel. to dispersion reln. 3=564
polar surface, ideal 3=21898
polarization and absorption phenomena 3=10060
Pomeranchuk and Okun rules, math. implications 3=7784
Pomeranchuk—Regge trajectories, two, conjecture 3=7805
potential, amplitude analyticity 3=12413
potential, dispersion-theory impulse approx. 3=5951
potential, Mandelstam's programme 3=10039

Scattering, particles—contd

potential, many-channel, complex ang. momentum 3=558
potential, many-channel, complex ang. momentum 3=7789
potential, reduction formalism 3=5939
potential, Regge poles and branch cuts 3=12412
potential scatt., asymptotic behaviour of S-matrix 3=14909
potential scatt., Green's function 3=14903
potential scatt., Jost functions 3=14902
potential scatt., max. and min. principle 3=14904
potential scatt. at negative ang. momenta, Regge trajectories 3=24630
potential theory, analytic props. of scatt. amplitude 3=24631
probability amplitude, quantized field, physical consequences 3=19588
probability distrib., cross-section 3=4346
quantum calc., semiclassical treatment 3=1618
quantum field theory, rel. to truncated vac. expect. values 3=14846
quasi-optical approach in quantum field theory 3=24577
radially inhomog. spherical medium, dyadic Green's function 3=24467
radiative corrections, unified tratment 3=12423
Regge amplitude, singularity 3=17203
Regge cut, experimental test 3=24655
Regge cuts and three-particle states in nonrelativistic model 3=23770
Regge formula, removal of background integral 3=7796
Regge hypoth., in multiple meson prod. 3=19661
Regge method for nonrelativistic 3-body problem, total arg. - momentum plane 3=24662
Regge parameters, dispersion relns. 3=12426
Regge plane, cuts, cancelling 3=12428
Regge pole hypoth., rel. to high-energy π photo-prod. 3=19672
Regge pole hypothesis, polarizations 3=12493
Regge pole parameters, dynamical determination 3=19569
Regge pole trajectories, analytic props. 3=24653
Regge-pole trajectories for Yukawa potl. 3=19570
Regge pole, trajectory, removal of "ghost" 3=5954
Regge poles and diagram technique 3=24661
Regge poles and high-energy elastic scatt. 3=5945
Regge poles and Landau singularities 3=14923
Regge poles and particle prodn. by γ -rays 3=22088
Regge poles and perturbation theory 3=14891
Regge poles, behaviour in a potential at high energy 3=2214
Regge poles calc. by continued fractions 3=2204
Regge poles, due to analyticity and unitarity 3=10042
Regge poles, eval. from perturb. theory 3=4347
Regge poles for hard-core potential scatt. 3=10043
Regge poles in high-energy scatt., impulse approx. 3=5948
Regge poles in relativistic wave eqns. 3=12424
Regge poles in the light of Levinson's theorem 3=24663
Regge poles, position, influence of spin 3=5955
Regge poles, propagator ghost elimination 3=17201
Regge poles, rel. to form factor data 3=566
Regge poles, rel. to real/imag. parts ratio 3=17213
Regge—Pomeranchuk trajectory and $80 m_\pi^2$ resonance 3=19572
Regge representation, extension 3=10049
Regge surfaces and singularities, relativistic theory 3=10044
Regge trajectories and elementary poles 3=10048
Regge trajectories, square-wall potl. 3=14907
Regge trajectories, weak-coupling limit 3=22089
Regge trajectory and resonant partial-wave amplitude 3=10046
Regge trajectory, lower bound 3=10045
Regge trajectory, restrictions by maximal analyticity 3=21250
Reggized photon theory 3=19574
relativistic, Regge pole method 3=19571
relativistic two-body problem governed by Dirac eqn. 3=21247
resonance classification and Ball—Frazer formula 3=10036
resonance widths, effect of target thickness, beam straggling 3=12651
resonances, overlapping, elimination of interference and bias 3=14931

Scattering, particles—contd

- "resonons", mass spectrum, by nonlinear field theory 3=22056
- rotating coordinates, use of 3=51
- S-matrix, analytic continuation in ang. momentum 3=2205
- S-matrix, group represent. in relativistic quantum theory 3=2203
- S-matrix, space-like intervals contrib. 3=2219
- S-matrix symmetry props., appl. to resonance reactions 3=557
- S- and T-matrix zeros in two static models 3=7790
- s-wave, energy moments of phase shifts 3=2220
- s-wave scatt., phase shifts for Gaussian potl. 3=24657
- scatt. approx. for long range forces 3=2222
- scatt. matrix, divergence exclusion 3=5962
- scatt. matrix nr. threshold, reconstruction 3=5956
- scattering amplitude, analytic continuation through 3-particle cut 3=19561
- scattering amplitude, pole position rel. to pole residue 3=568
- scattering matrix, relativistic invariant parametrization 3=5963
- several groups of many equiv. particles, interaction energy 3=17207
- shrinkage of diffr. pattern and Regge pole effects 3=19582
- single-channel, improved minimum princ. 3=9352
- single-channel phase shifts, static approx. and bounds 3=53
- singularities in ang. momentum plane 3=10054
- singularities in unphysical sheets 3=17210
- singularities of 4-pt. function with variable masses 3=19590
- singularities of scatt. ampl., charged scalar fixed-pt.-source theory 3=14912
- small-angle critical scatt. from cooperative assemblies 3=52
- small-angle multiple, fast charged, statistical theory 3=19585
- spacially extended particle theory 3=7767
- spherical dielec. particles of refr. index 1.25 3=16804
- spinless, charged, partial wave analysis 3=12411
- stable and unstable particles, dispersion relations 3=24632
- statistical model, large-angle elastic scatt. 3=7794
- thick absorber, single-scatt. process deriv. 3=10138
- three-body, non-relativistic, discontinuities across cuts 3=12427
- three-body problem for short-range forces 3=14919
- three equivalent particles, interaction energy 3=17206
- 3-j symbols, symmetry relations 3=7798
- three-particle, planar, formal theory 3=13999
- three-particle system, resolvent of Schrödinger operator 3=21244
- three-particle unitarity 3=19564
- 3/2 and 0 elastic 3=19586
- threshold behaviour, close-coupling effects 3=22502
- threshold effects in average cross-sections, R-matrix theory 3=10320
- transverse moments distrib. and high energy scatt. 3=22082
- two channel, pole residue relations 3=17216
- two-channel process, dispersion relns. 3=4344
- two-channel reactions, simple model 3=14886
- two-dimensions, scatt. amplitude 3=19563
- two-particle resonances, dispersion relns. 3=12483
- ultraviolet divergences in Feynman diagrams, removal 3=12401
- unitarity and evaluation of discontinuities 3=24629
- unitarity impulse approx. 3=19565
- unitary condition applied to Regge scatt. amplitude 3=22085
- unstable particle, with two stable ones 3=5923
- unstable particles, scatt. amplitude 3=550
- upper bound, high energies, improvement 3=17221
- variation principles for matrix elements 3=22093
- variational method, integral form 3=7122
- variational wave functions, hypervirial theorems 3=7128
- Yukawa coupling const. calc. 3=10051
- Yukawa potential, Regge poles and asympt. behaviour of amplitudes in perturb. theory 3=21249
- Yukawa potentials, complex 3=4339
- Yukawa, Regge pole trajectories for weak coupling 3=22092

Scattering, particles—contd

- Ar molec. beam on LiF cleavage plane 3=2680
- He molec. beam on LiF cleavage plane 3=2680
- He II, liq., Van Hove correl. functions 3=11703
- He³, 29 MeV, by Au, polarization 3=24976
- He³- α , resonating-group struct. in one-channel approx. 3=24811
- He³-He³, elastic, 3 - 12 MeV meas. 3=12521

Schlieren systems.

- colour schlieren photography in wind tunnels 3=271
- layer, uniform and plane, spectral and ang. distrib. rel. to noise 3=3883
- liquid free surface study 3=16744
- photography of orthogonal pinch discharge 3=7585
- plasma, r.f., photography 3=4146
- time resolved study of discharge, 0.4-4 mm Hg 3=9739

Scintillation counters

See Counters, scintillation.

Seals, glass—metal

See Glass—metal seals.

Seawater

- acoustic vels., 500 Kc/s small changes, meas. instrum. 3=13651
- artificial, light absorption 3=16626
- conductivity, electrical, var. with press. and temp. 3=14182
- electrical conductivity rel. to pressure 3=18486
- fallout, distrib. between soluble, particle and colloid states 3=6190
- noise, acoustic, breakers 3=21503
- North Pacific surface water, T content 3=24888
- optical nature 3=6952
- optical polarization, natural, rel. to depth 3=16200
- scattering, light, meas., submersible water, design theory 3=19023
- solubility of inert gases 3=23877
- sound scattering by surface, rel. to its roughness 3=1423
- u.s. velocity meas., Mediterranean, Jan. 1961 3=3442
- waves, Hamiltonian method 3=23580

Secondary electron emission

See Electron emission, secondary.

Sedimentation

- balance, for sub-sieve sizing 3=21278
- chemically reacting systems, rel. to isomerization and dimerization 3=3388-9
- colloidal electrolytes, rel. to molec. wt. detm. 3=6938-41
- flotation equil. in ultracentrifuge 3=6932
- fluids, theory 3=9377
- hydrometer, for spec. gravity meas. 3=7167
- interferometer technique for obs. 3=8979
- liquid sprays, drop size analysis 3=11363
- macromolecular chains in solvents, meas. 3=9454
- particles in atmosphere, under gravity 3=9023
- polydisperse systems, ultracentrifuge centre-piece 3=3420
- polymer mixture, rel. to mol. wt. distrib. 3=23554
- pressure and concn. depend. systems 3=6930
- rod-like mols. in ultracentrifuge 3=11361
- short columns, interference optics study 3=6933
- solid spheres in silicone oil 3=13620
- Tl₂SO₄-H₂O system, rel. to Svdeberg eqn. 3=5172

Seignette salt

See Rochelle salt.

Seismic waves

See also Seismology.

- attenuation in dispersive medium 3=7093
- compression, plane, in stratified medium 3=9537
- conical flow and Rayleigh scattering techniques 3=23966
- core-mantle boundary, refl. and refr. 3=3430
- crust and mantle, models, converted waves 3=3433
- earthquake generation by volume source with moment 3=1413
- earthquake, mechanism at focus 3=1412
- elastic, impulsive, diffraction and scattering 3=23965
- head waves from bed of finite thickness 3=6945
- interface, pulse obs. 3=1416
- long-period, from large near-surface nuclear explosions 3=13642

Seismic waves — contd

- Love waves in a nonhomogeneous internal stratum 3=16688
- microseisms, tripartite obs., Japan, IGY 1957/8 3=18478
- nonspecular boundaries in three-dim. models 3=3434
- P vel. and central density of the earth 3=16193
- quarry blast near Sydney, analysis 3=3426
- Rayleigh, from fault of arbitrary dip, radiation pattern 3=16687
- Rayleigh, in a two-layer heterogeneous medium 3=18471
- Rayleigh, phase, for detecting soft layers in earth's mantle 3=18472
- reflection, Cagniard's method 3=23570
- reflections at interfaces 3=21474
- S waves, radiation mode, deep-focus earthquake 3=18476
- SH interference wave propag., elastic spherical layer 3=18886
- SH, in semi-infinite region below crust 3=23963
- shock waves, qualitative characteristics. 3=200
- side waves, diffracted and refracted at vertical contact 3=18477
- from spherical cavities in rocks strained beyond the elastic limit, calc. 3=7279
- surface waves on slowly rotating earth. 3=195
- thin layer, effect on reflected wave 3=16689
- torsional oscillations, surface displacement 3=11379
- upper mantle of earth 3=21026
- velo., P and S, var. with depth 3=16191
- Zoeppritz's amplitude eqns., solns. 3=1417
- zone of low velocities, particle displacements 3=3432

Seismographs

See Seismology.

Seismology

- See also Geophysical prospecting; Seismic waves.
- absorption calc. rel. to freqn. and depth 3=6946
- array signal enhancement 3=18475
- correction for transfer function of seismometer 3=1415
- data processing from automatic digital recorder 3=18473
- earth fundamental oscillations and core rigidity 3=13643
- earthquake, New South Wales, May 22, 1961 3=13641
- Edinburgh research group 3=9002
- e.m. seismographs, effect of galvanometer—seismometer reaction 3=5183
- finite deformations in interior of earth 3=13644
- geophone arrays, Che yshev optimized 3=16192
- limestone, elastic props. invest., in situ 3=9003
- lunar seismograph for Rangerexpts. 3=9168
- microseisms rel. to cyclonic storms 3=6947
- Mohorovičić discontinuity, nature 3=18481
- observatories in USA for nuclear explosion detect. 3=5182
- photographic technique of surface motion 3=9004
- seismograph calibration, transient technique 3=1414
- seismograph, electronic, with capacitance pickup 3=3431
- seismograph, lunar 3=5241
- seismograph, piezoelectric detector, strong-motion 3=3435
- seismometer, inverted-pendulum element 3=11378
- transients, seismographs, analytical expression 3=18474
- underground explosions, detection, review 3=1418

Selenium

- absorption spectrum, amorphous impure solid 3=3017
- amorphous, electrophotographic latent image decay time meas. 3=5544
- amorphous, photoinduced discharge of xerographic plate 3=15613
- carrier mobilities and trapping centres 3=873
- conductivity, electrical, effect of grain size, various dopants 3=22951
- diffusion in GaAs, radioactive and elec. meas. 3=22809
- electrical properties, rel. to Br and Tl doping 3=17892
- etch studies of hexagonal single crystals 3=23385
- films, containing S, photoelectrets, depolarization 3=23006
- films, optical constants 3=25438
- force constant and vibrational spectrum detm. 3=17630
- grey, elec. cond. under shock wave action 3=830
- i.r. absorption by free carriers 3=13188
- metallic state 3=17812
- mirror for infrared polarization 3=24060
- photodepolarization, nonlinear, and carrier parameters 3=20417

Selenium — contd

- polycrystalline, conductivity ratio rel. to oxygen exposure 3=17893
- rectifiers and photocells, turnover phenomena 3=6607
- reflectance of vitreous and metallic forms in vac. u.v. 3=15651
- resistivity rel. to pressure up to 3×10^3 kgm cm⁻² 3=2902
- specific heat at low temp. 3=8362
- spectra, absorpt. and refl., in u.v. 3=8596
- spectrochemical analysis, impurity effects, arcs. 3=25847
- spin-spin coupling with protons 3=719
- thin film, absorption and reflectivity, u.v. 3=2995
- vitreous, elec. and optical props. 3=13081
- Th, diffusion, optical obs. 3=15512

Selenium compounds

- selenious acid, molten, Raman spectra, detection of H₂SeO₃ 3=137
- SeF₄, mol. structure, by electron diff. 3=25113
- SeF₆, mol. structure, by electron diff. 3=25113
- SeF₆, Raman intensities for $\nu_1(a_1)$ modes 3=22559
- SeO mol., $A^3\Sigma^- - X^3\Sigma^-$ system, rotl. analysis 3=25105
- SeO, $^3\Sigma^- - ^3\Sigma^-$ system, rational analysis 3=4758
- SeO₂XY, vibrational spectroscopic studies 3=15352
- [SeOXY]⁻, vibrational spectroscopic studies 3=13352
- Se-Te solid solutions, Hall effect, cond. elec., temp. var., thermoelectricity¹ 3=22952

Semiconducting devices

- See also Counters, semiconductor.
- amplifiers, low-noise 3=5841
- characteristics, effect of phonon, photon, electron wave vectors 3=4927
- charge storage, surface effects, appl. 3=8540
- conference, Philadelphia (1963) 3=14465
- current-voltage relns., rel. to injection 3=2880
- detector of mm and sub-mm radiation by free-carrier absorpt. 3=25385
- epitaxial, Ge surfaces for substrates 3=6880
- field-effect devices, hypercritical-field region 3=10865
- field effect devices, saturation current, physical explanation 3=13101
- Hall-effect microwave frequency converter 3=10864
- i.r. beam modulation devices 3=1809
- i.r. photodetectors, comparative study 3=291
- light source thermal radiators, selective, possibility 3=23993
- metal-interface amplifier, expts. and theory 3=888
- metal-semicond. contact, arbitrary injection levels, bipolar theory 3=20348
- metal-semiconductor contacts, ohmic, properties 3=25386
- Nernst-Ettingshausen generator 3=3998
- Nernst generators and refrigerators, theory 3=10863
- new components for electronics applications 3=20369
- nuclear instruments symposium 3=12364
- nuclear-radiation detectors, review 3=12375
- oscillator effect, mechanism and possible applications 3=10758
- p-n-p-n Si controlled rectifiers, current gain 3=17921
- particle detectors, fission fragments, multiplication phenomena, gold surface barrier 3=19509
- particle detectors, p-silicon, lithium, n-i-p 3=14830
- particle detectors, time characts. 3=22040
- piezoresistive devices, recent advances review 3=22969
- semiconductor devices, of Au, low resistance 3=20360
- surface-barrier rectifiers, photovoltaic response 3=25387
- terminal voltages, Fermi levels 3=20347
- thermistors, F-type, as thermometer 3=7376
- thermistor thermometer 3=24091
- thermistors, digital display 3=24090
- thermistors, temp. gradient in, effect on accuracy 3=19132
- thermometers, resistance, for low-temp. meas. 3=11984
- transistor-like, hypothetical, noise theory 3=13099
- transit-time mode in two-barrier devices 3=431
- triodes, hot-carrier, with thin-film metal base 3=20360
- Au-to-CdS rectifying contacts, at high impressed fields 3=22968
- CdS, thin-film triodes 3=17920
- Cu₂O rectifiers, turnover phenomena 3=6607

Semiconducting devices — contd

- Ge, effect of minute resistivity variations 3=15573
- Ge oscillators, carrier behaviour, microwave obs. 3=10862
- Ge-Al-Al₂O₃-Au amplifier, meas. 3=888
- Se rectifiers, turnover phenomena 3=6607
- Si particle detectors, n-type 3=2166
- Si photovoltaic cells, changes prod. by particle irradiation 3=912
- Si, piezoresistive pressure transducers 3=887

diodes and junctions

- breakdown, surface, Si diodes, alloy, D-209 3=10856
- carrier lifetime meas., technique 3=6606
- diffused p-n junction, emitter injection efficiency 3=4934
- diffused and surface barrier, hole-electron ionization energy 3=10859
- diodes, acoustic vibration excitation 3=25379
- diodes, forward-biased pt. contact, negative resistance, oscillation 3=10855
- diodes, high-freq. phenomena 3=13092
- diodes, pulse generator for transient analysis 3=24194
- diodes, technology review 3=20352
- electron emission, hot, by p-n junctions 3=13087
- electron field emission from p-n junction 3=14621
- Esaki junctions, electron tunnelling, theory 3=6608
- Esaki junction, lattice model analysis 3=2938
- flexodes, based on reversible ion drift 3=20349
- high-low junctions, dynamic behaviour 3=4931
- I-V characteristics, structure det. by differentiation 3=22957
- injection efficiency, metal contacts, theory 3=22961
- junctions, electron tunnelling in Esaki type, theory 3=6608
- light, reflection and guiding, p-n junctions 3=23042
- masers, optical, GaAs, injection, quenching 3=22015
- masers, optical, p-n junction, loss reduction, by doping var. 3=22021
- metal-semicond. contact, Schottky barrier meas. 3=10847
- microwave, review 3=6556
- n-n heterojunctions 3=13088
- p-i-n diodes, plasma contraction, in magnetic 3=20353
- p-n, elastic and plastic deformation effects 3=10844
- p-n Ge junction, tunnelling 3=22924
- p-n heterojunctions, space-charge theory 3=25375
- p-n, inductive impedance, simplified theory 3=882
- p-n junctions, charge multiplication 3=13089
- p-n junction, degenerate semiconds., prod. of negative temp. states 3=4928
- p-n junction detector, basic principles 3=4298
- p-n junction, effect of layer with strong recombination 3=17904
- p-n junction, nonuniformly illuminated, photovoltage 3=23024
- p-n junction particle detector, SiO₂ passivation 3=7749
- p-n junctions, photomagnetic effect 3=10846
- p-n junctions, photomagnetoec. effect, theory 3=17965
- p-n junctions, recomb. statistics for Auger effects 3=13090
- p-n junctions in Si 3=878
- p-n junction, rel. to transition-region recomb. 3=2934
- p-n, for nuclear radiation recording 3=2168
- p-n, position depth, meas. device 3=2933
- p-n potential distrib. meas., analogue method 3=17907
- p-n, shape, rel. to directed crystallization 3=17906
- p-n, switch-on transients 3=17903
- p⁺-n-n⁺ diodes, reversed-bias, for impurity profile meas. 3=25273
- p-n-p variable-capacitance, applied to microwave switching 3=25381
- p-n-p-n, V/A characts., minority carrier distrib. and electric field 3=10850
- particle detector, n-i-p, Li 3=14830
- photodiode, exponentially retrograded 3=13093
- photodiode, Ge point contact for 1000 Mc/s 3=886
- photovoltaic solar energy converters, efficiency 3=15637
- phthalocyanines, rectification props. 3=17916
- piezo-junctions in Ge, Si 3=2940
- plasma, micro, at crystal dislocations, stair-rod, p-n junctions 3=20351

Semiconducting devices—contd

diodes and junctions—contd

- semiconducting junctions, p-n, n effects, max. allowable 3=22959
- Si-Hg junctions, surface barriers 3=15598
- step junctions, symmetrical, space-charge-layer width and capacitance 3=881
- stepping diode, description of three types 3=10857
- surface barrier, particle detectors, protection, against Hg vapour in vac. pumps 3=22043
- tunnel, A^{III}B^V materials, conductivity minimum theory 3=20129
- tunnel, alloyed contacts of Au, to Si and Ge, low resistance 3=20360
- tunnel diode decade counter 3=5611
- tunnel diode development, review 3=8538
- tunnel diodes, effect of degeneracy 3=17679
- tunnel diode pulse-shaping circuits 3=19139
- tunnel diode univibrator, improving 3=14488
- tunnel diode, use in voltage sensitive pulse height discriminator circuit 3=24189
- tunnel diodes, char. curve meas. 3=17917
- tunnel diodes, construction method 3=13094
- tunnel diodes, field decay of local states 3=15453
- tunnel diodes, junction potential studies 3=20357
- tunnel diodes, low-noise, microwave 3=6610
- tunnel diodes, parameter determ. 3=25384
- tunnel diodes, review 3=14604
- tunnel, four as bridge, forming fast discriminator 3=19146
- tunnel junction, barrier thickness and height from J-V curves 3=20358
- tunnel junctions, I-V relationship, low-voltage 3=13086
- tunnel, meas., negative resistance and capacitance 3=22964
- tunnel, n-PbS-p-PbO films, in Resistor charge-storage tubes 3=25419
- tunnel, V-I curves, calc. 3=20356
- II-VI cpds., photovoltaic heterojunctions 3=20420
- varactor, Q meas. 3=19303
- Zener diodes as voltage-controlled capacitors 3=25380
- Au-n-type Si Schottky barrier, cond. props. 3=20355
- CdS, dielec. diode using space-charge effects 3=861
- CdS diodes, injection currents, space charge limited pulse and d.c. 3=15602
- CdS, sandwich cells, photovoltaic effect 3=8569
- CdSe point contact diodes, relaxation oscillations of current 3=2936
- CdTe solar cells, description 3=20420
- Cu₂S-CdS, diode characteristics, interpretation 3=25382
- GaAs 3=25364
- GaAs diode, laser action, 100°K 3=19491
- GaAs diodes, coherent, temp. effects 3=22962
- GaAs, diodes, maser, electroluminescence, mag. fields, shift, 90 kG 3=20542
- GaAs, double-injection diodes oscill due to deep levels 3=15583
- GaAs junction, laser action 3=9982
- GaAs junction lasers, light emission 3=25445
- GaAs junctions, laser action, coherent emission 3=4968
- GaAs, laser, injection, line width, var. current 3=14808
- GaAs, light modulation at 200 Mc/s 3=5895
- GaAs optical maser 3=9971
- GaAs, p-n junction as diode and photocell 3=17914
- GaAs, p-n junctions, elec. breakdown 3=20350
- GaAs p-n junctions, electroluminescence, and tunnelling 3=20543
- GaAs, p-n junction, photoeffect, nonlinear 3=20421
- GaAs, p-n junctions, photoresponse near band edge 3=10848
- GaAs p-n, light propag. in dielectric waveguide mode 3=10851-2
- GaAs, p-n junction laser, theory 3=12351
- GaAs, p-n junctions, resistance, temp. var., direct-indirect transition 3=25377
- Ga(As_{1-x}P_x) junctions, forward biased, coherent emission, 77°K 3=7734
- GaAs p-n junction, forward biased, stimulated emission, 77°K 3=7735
- GaAs p-n junction, breakdown voltage 3=25376
- GaAs p-n junctions, avalanche breakdown meas. 3=6574
- GaAs, p-n junctions, spectral photoresponse 3=13135

Semiconducting devices—contd**diodes and junctions—contd**

- GaAs, p-n, photon emission, tunnelling-assisted 3=4933
 GaAs, p⁺-on-n junction, voltage breakdown as function of n-resistivity 3=13085
 GaAs, recombination radiation, depend. on current 3=13091
 GaAs, recombination radiation in diode 3=10853
 GaAs shallow junction, spectral photoresponse 3=13134
 GaAs, spectrum, recomb. radiation, 77-300°K 3=17990
 GaAs, spectrum, 2.1°K, donor-acceptor absorbt. 3=25458
 GaAs, spontaneous and stimulated emission 3=25495
 GaAs, tunnel diodes, degradation, rel. to current and voltage 3=20359
 GaP, p-n junction, electroluminescent device 3=13221
 GaP surface-barrier diodes 3=17912
 GaP, Zn diffused, red emission, at reverse breakdown 3=8532
 GaSb diodes, radiative recomb. effects 3=17913
 GaSb Esaki diodes, tunnelling current density rel. to crystallographic polarity 3=17911
 GaSb p-n junction, injection electroluminescence 3=15721
 Ge alloyed p⁺-n junctions, microplasmas 3=8533
 Ge diode recombination radiation shift on pulse current injection 3=20539
 Ge diodes, microplasma breakdown 3=25383
 Ge junction, uniaxial stress effect on excess current 3=25378
 Ge magnetodiode, carrier distrib. rel. to mag. fld. 3=17909
 Ge, n-p diode, electron-hole transitions, inductive props. 3=17910
 Ge photodiode current, mag. field effects 3=20408
 Ge piezo-diodes and triodes 3=2940
 Ge p-n junction, laser illuminated, excess photon noise 3=11908
 Ge p-n junction, reversed bias, light emission, origin 3=10845
 Ge p-n junction, tunnel current 3=2931
 Ge p-n junctions, noise due to illumination 3=22958
 Ge, p-n junctions, spectral photoresponse 3=13135
 Ge, p-n, plastically deformed, negative resistance and double injection 3=8534
 Ge point contact diodes, negative resistance 3=2935
 Ge point-contact diodes, negative resistance 3=8535
 Ge shallow junction, spectral photoresponse 3=13134
 Ge tunnel-diode junctions, impurity drift 3=20362
 Ge tunnel diodes, nomograph for prepn. 3=885
 Ge tunnel diodes, peak current, rel. to acceptor conc. 3=8537
 Ge tunnel diodes, voltage annealing of radiation damage 3=10860
 Ge, tunnel (Esaki) diodes, neutron-irradiated 3=17918
 Ge-GaAs tunnel heterojunctions, phonon and polaron interaction 3=6609
 Ge-Li drift, for γ -ray spectra 3=17238
 Ge, Sb-doped, tunnelling, strain effects 3=13095
 Ge and Si, p-n junctions, resistance rel. to elastic deformation 3=17902
 InAs diode, maser, optical, mag. tunable, i.r. 3=19494
 InP Esaki diodes, prepn., props. 3=884
 InP-GaAs n-n heterojunction, meas. 3=13088
 InSb, p-n junctions, elec. and photoelec. props. 3=879
 InSb, tunnel, recombination radiation 3=23122
 PbS, p-n junctions, prep. by Cu diffusion 3=15593
 PbTe abrupt junctions, barrier capacitance, 100 kc/s 3=13106
 Si alloy-diffused variable-capacitance diodes 3=8536
 Si computer diodes, design 3=20354
 Si counter diodes, neutron irradi., Si recoil spectra 3=25307
 Si diode, reverse characteristics 3=10858
 Si diodes for cyclotron oscillator and magnet power supplies 3=5796
 Si double-injection diodes oscill due to deep levels 3=15583
 Si junction detector, effect of forward-voltage ion-drift 3=2930
 Si junction particle detector 3=529
 Si junction particle detector 3=22042
 Si junctions, epitaxial growth 3=23418

Semiconducting devices—contd**diodes and junctions—contd**

- Si junctions, p-n, n irradi. effects, max. allowable 3=22959
 Si, n⁺-p-p⁺, diffused, for dosimetry, fast n 3=24816
 Si negative resistance diodes, prepn. 3=2937
 Si piezo-diodes and triodes 3=2940
 Si, p-n, hot electron emission 3=883
 Si p-n junction, electron field emission 3=14621
 Si, p-n junction, excess reserve currents and field effects 3=22960
 Si p-n junction, laser frequency mixing obs. 3=9981
 Si p-n junction, reversed bias, light emission, origin 3=10845
 Si p-n junction, thermally oxidized, γ -irradi. effects 3=4930
 Si p-n junctions, avalanche breakdown 3=15599-600
 Si p-n junctions, charge multiplication 3=13089
 Si p-n junctions, hot electron emission 3=13087
 Si p-n junctions, microplasma breakdown 3=20351
 Si, p-n junctions, photoresponse near band edge 3=10848
 Si p-n junctions, prebreakdown microplasmas as γ detectors 3=14946
 Si p-n junctions, reverse characts., heat treatment effect 3=15579
 Si, p-n junctions, spectral photoresponse 3=13135
 Si p-n junctions, microplasmas 3=2929
 Si point contact diodes, negative resistance 3=2935
 Si point-contact diodes, various phenomena 3=880
 Si shallow junction, spectral photoresponse 3=13134
 Si, step, avalanche multiplication 3=4932
 Si surface barrier junction, minority carrier recombination time meas. 3=17905
 Si tunnel diodes, effect of degeneracy 3=17679
 Si tunnel diodes, P diffusion-doping 3=20361
 Si, tunnel (Esaki) diodes, neutron-irradiated 3=17918
 Si-Au junction, reverse current enhancement 3=15603
 SiC, p-i-n junction, V-I characts., photovoltaic effect, p-n luminescence 3=13082
 SiC, p-n, hot electron emission 3=883
 Si-Hg junctions, surface barriers 3=15598
 SiO₂, p-i-p junctions, rectification and e.m.f. 3=10849
 Si-SiO₂-metal diodes, rectification 3=22963
 Ta₂O₅, p-i-p junctions, rectification and e.m.f. 3=10849
 Ti oxide anodic films, graded p-n junctions 3=4929
 Ti oxide, thin film diodes 3=17915
 TiO₂, p-n junctions, piezoeffects 3=13127
 TiO₂, point-contact diodes 3=10854
 ZnSe, p-n junctions, electroluminescence 3=11011
 ZnTe-CdS heterojunctions, growth and props. 3=23419
- transistors**
 a.c. discriminator, transistorized 3=5613
 amplifiers, high input resistance 3=14482
 c-c impedance, freq. var., mag. field, 2N34, 2N35, c-e stage 3=20364
 characteristic curve tracer 3=15605
 cut-off freqs. 3=2941
 development, review 3=8538
 drift, cut-off freq. rel. to collector voltage 3=13100
 drift type, effects of collector depletion-layer width 3=20363
 filamentary, inductive props. 3=22965
 inductive, input impedance analysis 3=22966
 junction, a.c. parameters rel. to injection level 3=2939
 mesa, Ge, contact fabrication 3=20365
 microwave, review 3=6556
 phototriode, theory 3=20419
 probe unit for nuclear counters 3=4287
 thin-film triodes, double barrier model 3=10861
 transient response of transport factor, calc. 3=8539
 transistorized electrometer voltmeter 3=12045
 transit-time mode in two-barrier devices 3=431
 transitory response to small signals 3=17919
 CdS, unipolar, surface 3=13097
 GaAs, optical, using recombination radiation collection by diode 3=13096
 Ge, evap.-condensation method for films 3=23511
 Ge, high-freqn. high-gain, surface depend. 3=13098
 Ge mesa, direct radiative recombination 3=22967
 Ge, vacuum-drying effects on surface props. 3=2942

Semiconducting materials

- See also Magnetoelectric effects; Photoconductivity; Photovoltaic effects.
- $A^{II}B^{VI}$ cpds., cond. mechanism, Hall coeffs. 3=20327
- $A^{II}B^{VI}X^{VI}$ compounds, elec. props. 3=2881
- $A^{II}B^{VI}-A^{II}B^{VI}$ films, activation energies 3=2882
- $A^{II}B^{IV}C_2V$ type, chalcopyrite structure, conduction band calc. 3=17871
- $A^{III}B^V$ cpds, bond character rel. to SiC and ZnS 3=2688
- $A^{III}B^V$ cpds., doping with group IV elements 3=12942
- $\alpha, \gamma-Al_2O_3$, doped and undoped, cond. 3=6591
- anthracene, dark currents, temp. depend. 3=15584
- anthracene, excess defect electrons, density of states 3=4844
- carrier mobility, during melting 3=21402
- compounds with wurtzite structure, hole energy 3=15568
- conductivity about melting pt. 3=21614
- conference, Moscow (1961) 3=13056
- copper phthalocyanine, crystals, resistance, effect of halogens 3=6593
- diamond, cyclotron resonance, millimetre, 70 Gc/s 3=10637
- diamond, i.r. absorption rel. to lattice vibration 3=10577
- diamond, type IIb, optical phonon effects 3=10933
- diamond-type, valence band Landau levels 3=10761
- diamonds 3=22943
- diamonds 3=22944
- diamonds, band structure, simplified tight-binding approx. 3=22622
- dislocation-free, yield behaviour 3=23322
- dislocation velocities and densities, erratum 3=10660
- elastic props. of diamond, blende, wurtzite types 3=23279
- films prodn. by evaporation, control of parameters 3=25776
- generation-recombination noise in single crystals 3=4913
- glass, crystallite detection by electrical conductivity 3=8921
- glasses, alkali-free magnesia-lime, conductivity, electrical, effect of Al_2O_3 3=17880
- graphite, n-irradiated, annealing effects 3=22867
- Group II-VI, conduction electron spin resonance 3=20642
- Group II-VI, surface conduction 3=17900
- Group III-V with Group V substituents, defect equilibria 3=22758
- Groups IV, III-V, II-VI, band structure, photoemission investig. 3=20318
- guanine, $-120^\circ C$ to $+100^\circ C$ 3=866
- imidazole, effect of purification on elec. props. 3=10826
- impurities diffusion in melt 3=18804-5
- ionic photoconductive dyes, charge carrier sign 3=8531
- isoelectronic series 3=20297
- metal-semicond. systems, barrier height studies 3=25387
- naphthalene, hole mobility, calc. 3=20339
- new materials for electronics applications 3=20369
- optical constants, transmission meas. on single crystals 3=23041
- organic, dielec. props. of powders 3=8557
- organic, photoconductivity, two-exciton ionization calc. 3=20396
- orientation, molten metal etches 3=3263
- phthalocyanine, metal-free crystals, bulk currents 3=8528
- polyenes, linear, mobility and elec. cond. calc. 3=4926
- polymer; coordination, Cu derivative 3=22950
- polymers, highly conjugated, synthesis and props. 3=10837
- polymers, organic, piezo-resistive effect 3=852
- radiation-defect annihilation, kinetics, impurity effects 3=22710
- rare-earth-doped, proposed d.c. -pumped laser action 3=24521
- rare earth monosulphides and nitrides 3=20342
- reflection and transmission coeffs., simultaneous meas. 3=18961
- rutile, Al-depend, effect of O_2 pressure 3=15596
- rutile, bulk-cond. 3=10842
- sphalerite-type structures, magnetic susceptibility rel. to chemical binding 3=20549
- sphalerite and NaCl structures, prop. inter-relations 3=22922
- structural defect study, X-ray camera 3=25693

Semiconducting materials—contd

- summary of theoretical papers, Exeter, 1962, conference 3=13047
- surface props. from i.r. meas. 3=13557
- susceptibility, meas. by modified Gouy method 3=21925
- ternary cpds., some, thermoelec. power, resist., Hall const. 3=8518
- ternary semicond. cpds., ordering mechanism 3=18350
- for thermoelectric cooling 3=19167
- thin slices, elec. cond. theory 3=851
- III-IV, atomic heat, temp. var. 3=12928
- III-V compounds, mol. effective charge and atomic polarizabilities 3=17637
- III-V cpds., polishing etchants for 3=6821
- III-V cpds., thermal props., bonding 3=2914
- III-V cpds., valence band structure 3=2753
- III-V and II-VI compounds, elec. resistance, temp. coeff. of high-pressure phases 3=859
- transition-metal oxides and sulphides, pressure effects on elec. cond. 3=25370
- transition metal oxides, conduction by internal friction meas. 3=10836
- transport phenomena, summary of exptl. papers at Exeter, 1962, conference 3=13046
- trapping levels, fast, meas. from photocond. 3=17846
- trapping level meas., electrical 3=20326
- AgBr, Hall mobility of holes 3=13080
- AgBr, magnetoresist. and cond. band structure 3=8529
- AgCl, trapping level spectrum, thermal effects 3=8397
- AgCl, AgBr, electron mobility in polaron theory 3=2768
- AgInSe₂, prep. and props. 3=864
- AgInTe₂, prep. and props. 3=864
- AgInTe₂-CdTe solid soln., elec. props. 3=876
- AgInTe₂-HgTe solid soln., elec. props. 3=876
- AgInTe₂-HgTe-CdTe solid soln., elec. props. 3=876
- AgSbTe₂-PbTe solid soln., elec. props. 3=876
- AgSbTe₂-PbTe-SnTe solid soln., elec. props. 3=876
- AgSbTe₂-Se, effect of doping 3=875
- AgSbTe₂-SnTe solid soln., elec. props. 3=876
- Ag₂Se, thermal and elec. props. 3=2926
- Ag₂Te, properties, $+20^\circ$ to $-190^\circ C$ 3=20343
- AgTlTe, prep. and props. 3=874
- Al oxide, negative resistance 3=20321
- AlSb i.r. Faraday effect meas. 3=10816
- AlSb, direct interband energy gap 3=8586
- AlSb, metallic transformations at high pr. 3=11211
- AlSb-GaSb, conductivity and Hall effect 3=25352
- AlSb, Ta doping and high resistivity 3=13068
- As, nonohmic magnetoresistance, thermal origin 3=8512
- As₂Se₃, props. rel. to crystalline-vitreous transformation 3=10802
- B, resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
- BaB₂ 3=8330
- BaTiO₃, doped, Hall effect and elec. cond., temp. depend. 3=8515
- Bi, carrier props. from magnetoreflexion 3=8581
- Bi, carriers, from i.r. absorpt. data 3=4970
- Bi, current carried change due to Se admixture 3=4904
- Bi, elec. and thermal transport properties 3=10808
- Bi, Esaki effect, nonlinear theory 3=25353
- Bi, Hall coefficient 3=10807
- Bi, nonohmic magnetoresistance, thermal origin 3=8512
- Bi-0.2 at. % Sn, light and heavy holes 3=25355
- Bi, quasistatic cond. in mag. field 3=2903
- Bi, scattering time at low-temp. 3=10809
- Bi and Bi-Sb alloy, magnetoresistance, non-linear, $2^\circ-4^\circ K$ 3=10803
- Bi and Bi-Sb alloys, resist. elec. and Hall coeff., var. with grain size 3=20323
- Bi, Bi-Sb, Ettingshausen figure of merit 3=13070
- Bi₂S₃, Hall effect and cond., single crystals 3=22937
- (Bi_x-x, Sb_{2-x})Te_x (TySe_{2-y}), elec. props. 3=17869
- Bi-Sb alloys, thermoelec. props., rel. to mag. fld. $77^\circ-295^\circ K$ 3=10894
- Bi-Sb alloys, thermomagnetic effects, 80° to $300^\circ K$ 3=18006
- Bi-Sb alloys, thermomagnetic figure of merit, and Ettingshausen cooling 3=22938
- Bi-Sb, effective masses meas. 3=15587

Semiconducting materials—contd

- Bi₂Se₃, doping mechanism 3=8516
 Bi₂Se₃, electrical props. rel. to elastic strain 3=10832
 BiTe band structure, calc. by augmented plane waves meth. 3=10746
 BiTe, mobility 3=10805
 Bi₂Te₃, elec. potl., rel. to mechanical deformation 3=2901
 Bi₂Te₃, electrical props. rel. to elastic strain 3=10832
 Bi₂Te₃, electronic band structure 3=10627
 Bi₂Te₃, free carrier plasma edges 3=22939
 Bi₂Te₃, galvanomagnetic props., anisotropy 3=10804
 Bi₂Te₃-Bi₂Se₃ alloys, energy gap 3=13500
 Bi₂Te₃-xSe_x, effect of oxygen on elec. props. 3=860
 C, resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
 CaB₂ 3=8330
 Cd₂As₂, Cu doped, elec. props. analysis 3=2906
 CdF₂, conversion from insulator 3=8522
 CdGeAs₂, thermoelec. power, resist., Hall const. 3=8518
 Cd_xHg_{1-x}Te alloys, optical and electrical properties 3=10938
 CdIn₂Se₄, prep. and props. 3=864
 CdIn₂Se₄, resistivity and thermal e.m.f. rel. to temp. 3=25350
 CdIn₂Te₄, prep. and props. 3=864
 CdIn₂Te₄, resistivity and thermal e.m.f. rel. to temp. 3=25350
 CdO films, elec. and optical props. 3=25359
 CdS acoustic wave amplification, by electron-phonon interaction 3=20092
 CdS, bound excitons 3=10630
 CdS, carrier mobility and scattering 3=8523
 CdS, current and field inhomogeneities 3=2905
 CdS, donor imperfections rel. to hybrid Frenkel-type disorders 3=2788
 CdS, drift mobility of electrons and holes, 500-80°K 3=4918
 CdS, effect on elec. props. of neutron irradi. 3=4917
 CdS, effect of hydrostatic pressure 3=15588
 CdS, electrical conductivity and Hall effect 3=25360
 CdS, electrical pot. distrib., anode drop, sorbed gas effects 3=17872
 CdS, electron bombardment, energy transport processes 3=13072
 CdS, electron mobility 3=22941
 CdS, films, current noise 3=25361
 CdS, γ -ray induced conductivity 3=2908
 CdS, hole injection from Cu₂S 3=25382
 CdS i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
 CdS, n-type, Hall mobility 3=863
 CdS, n-type, u.v. excitn., photo e.m.f. 3=2974
 CdS, photocurrent, effect of shadow region 3=13131
 CdS, polycryst., photocurrent carriers 3=905
 CdS, space-charge-limited current, expt. 3=861
 CdS, space-charge-limited currents 3=25362
 CdS, space-charge-limited currents, modulation 3=862
 CdS, space charge limited current, noise 3=8520
 CdS, space-charge limited injection currents 3=2907
 CdS, surface conduction 3=17900
 CdS, thermally stimulated elec. cond., elec. field effect 3=6592
 CdS, trapped space charge, thermal release 3=4949
 CdS, trapping level meas., electrical 3=20326
 CdS, true photoconductivity 3=17955
 CdS, u.s. amplification, rel. to electron-lattice interaction 3=10730
 CdS, X-ray spectrum, short wave limit 3=4919
 CdSb, band structure 3=10811
 CdSb, conductivity, Hall effect, temp. var., carrier mobility 3=25358
 CdSb, conductivity, type 3=25357
 CdSb, elec. and thermoelec. props. 3=17971
 CdSb, electron states, extremal points, dispersion 3=17684
 CdSb, impurity effects on elec., thermoelec. props. 3=20325
 CdSb, 2.4-4.2°K 3=25356
 CdSe, conduct. induced by electron irradi. 3=17873
 CdSe, exciton lines and lattice defects 3=6652

Semiconducting materials—contd

- CdSe, excitons, valence band 3=20441
 CdSe, frequency mixing of ruby laser axial modes 3=9970
 CdSe, γ -ray induced conductivity 3=2908
 CdSe layers, conductivity due to electron irradi. 3=2910
 CdSe, surface interact. with O₂, meas. 3=11326
 CdSnAs₂, conduction band, calc. 3=17871
 CdSnAs₂, n-type, semicond. props 3=4920
 CdSnAs₂, thermoelec. power, resist., Hall const. 3=8518
 CdTe, band structure 3=25472
 CdTe, capture levels, from photocond. meas. 3=15628
 CdTe, Cr acceptor level 3=20646
 CdTe, double acceptor defect 3=17874
 CdTe, effective electron mass eval. 3=10812
 CdTe, excitons, valence band 3=20441
 CdTe films, rel. to deposition temp. 3=23508
 CdTe, n-type, elec. transport meas. 3=8519
 CdTe, n-type, Fermi level position meas. 3=2758
 CdTe, valence band, l.c.b.o. method 3=779
 CdTe, X-ray spectrum short wave limit 3=4919
 Ce_{3-x}S_x, conduction band structure 3=10628
 CoAl₂O₄, electron and ionic cond. 3=15589
 CoAsS, cond, elec., temp. var., paramagnetism 3=6601
 CoCr₂O₄, electron and ionic cond. 3=15589
 CoSb₂-type cpds, semiconductivity 3=20329
 Cr nitrides, elec., thermoelec. props. 3=865
 Cr₂O₃, conductivity, rel. to nuclear radiation 3=2909
 CsAu, resistivity, Hall const., Seebeck coeff. 3=20328
 Cu₂A^mB₃ⁿ type, crystal structure 3=13513
 CuFeS₂ 3=1027
 CuI films, oxygen-controlled conduction 3=13071
 CuInSe₂, prep. and props. 3=864
 CuInTe₂, prep. and props. 3=864
 Cu₂O, Hall effect, rel. to defect structure 3=22735
 Cu₂O, luminescence and elec. cond., elec. field effect 3=22942
 Cu phthalocyanine, Hall effect and carrier mobility 3=2911
 FeAs₂, cond. elec., temp. var., paramagnetism 3=6601
 FeAsS, cond. elec., temp. var., paramagnetism 3=6601
 GaAs, behaviour of Li, rel. to Zn and Te doping 3=10818
 GaAs, carrier concentration meas. 3=17878
 GaAs, crystal growth, reduction of Si contamination 3=13416
 GaAs, current and Hall coeff. rel. to elec. fld, 4°-30°K 3=10813
 GaAs, defects prod. by Li 3=8423
 GaAs, donor-doped, acceptors, rel. to Li diffusion 3=17877
 GaAs, doping behaviour of Se, model 3=12942
 GaAs, effective electron mass, from Faraday effect, i.r. 3=17986
 GaAs, elec. cond., rel. to high defect concn. 3=791
 GaAs, elec. props. 1.8°-300°K 3=10814
 GaAs, electron effective mass, depend. on density 3=17885
 GaAs, electron effective mass, Fermi energy, from absorpt., light 3=23070
 GaAs, electron and hole scattering 3=17884
 GaAs films, preparation 3=17875
 GaAs, galvano- and thermomagnetic effects, on n-type 3=10817
 GaAs-Ge tunnel heterojunctions, phonon and polaron interaction 3=6609
 GaAs growth from Ga, zone-melting technique 3=23410
 GaAs lattice absorption i.r. bands, shell model applic. 3=10927
 GaAs, Mg ionization energy 3=4922
 GaAs, oscills. due to deep levels 3=15583
 GaAs, photo-Hall effect in high resistivity crystals, temp. depend. 3=6632-3
 GaAs, recombination radiation 3=10853
 GaAs, recombination radiation obs. 3=4921
 GaAs, recombination spectrum, effect of doping 3=20476
 GaAs, reflection spectra rel. to band struct. 3=925
 GaAs: Se, electron conc., 650-1100°K 3=22945
 GaAs, spectrum, recomb. radiation, 77-300°K, diode 3=17990
 GaAs, surface masking during Zn and Cd diffusion 3=25289
 GaAs: Te, electron conc., 650-1100°K 3=22945
 GaAs, temp., mag. field, var. 3=25364

Semiconducting materials—contd

- GaAs, thermal oxidation of wafers 3=2943
GaAs, under high elec. fields 3=17876
GaAs, valence band, l.c.b.o. method 3=779
GaAs, Zn-doped, carrier density 3=16122
GaP, elec. cond. and Hall effect, 78°-100°K 3=17879
GaP, i.r. Faraday effect meas. 3=10816
GaP, n-type, thermocompression bonding of contacts 3=23722
GaP, p-type, energy level system 3=15632
GaP, radiative transitions near band edge 3=10949
GaS layer cpd., band structure 3=20330
GaS, optical absorption and photoconductivity, 4° to 300°K 3=10950
GaSb, direct interband energy gap 3=8586
GaSb, exciton and impurity absorption and emission 3=10948
GaSb, n-type, transport props. 3=10819
GaSb, p-type, magnetoresistance 3=2912
GaSb films, undoped, sputtered on glass, structure and elec. props. 3=3357
GaSb, metallic transformation at high pr. 3=11211
GaSb, reflection spectra rel. to band struct. 3=925
GaSe, elec. cond. and Hall effect 3=2913
GaSe layer cpd., band structure 3=20330
GaSe, optical absorption and photoconductivity, 4° to 300°K 3=10950
GaTe, elec. cond. and Hall effect 3=2913
GaTe, optical absorption and photoconductivity, 4° to 300°K 3=10950
Ga₂Te₃, properties at solidus boundary 3=10815
Ge—Si alloys, thermal conductivity at high temps. 3=10616
GeTe, carrier compensation for various solutes 3=25365
Hg[Cd]Te—In₂[Ga₂]Te₃ solid solutions, structure and properties 3=11301
HgIn₂Se₄, prep. and props. 3=864
HgIn₂Te₄, prep. and props. 3=864
HgSe, dispersion mechanism and effective mass 3=870
HgTe, dispersion mechanism and effective mass 3=870
HgTe, electrical and optical properties 3=10835
HgTe—CdTe, electrical properties rel. to composition 3=17890
HgTe—MnTe alloys, elec. props. 3=20335
I, resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
I, resistivity var. with temp. and press. 3=8524
In, preparation, high-purity, by distillation 3=20331
InAs, charge and heat transport at low temps. 3=6596
InAs, effective electron mass, from optical rotation, i.r., 293-603°K 3=20333
InAs, electric properties, high-pressure effects 3=17886
InAs, electron effective mass, depend. on density 3=17885
InAs, electron and hole scattering 3=17884
InAs, electron-hole scatt. and electron drift vel. 3=25222
InAs, light transmission, at liquid H temp. 3=6339
InAs, mag. properties calc. 3=23139
InAs, mag. suscept., 60°-1200°K 3=11027
InAs, magnetoresistance, var. with field, up to ~300 kOe 3=17887
InAs, metallic transformation at high pr. 3=11211
InAs, n-type, quantum galvanomag. effects, 20°-360°K 3=4925
InAs, plasma pinch, sound-wave generation, at sufficiently high currents 3=6597
InAs, reflection spectra rel. to band struct. 3=925
InAs, reflectivity meas. 3=10910
InAs—CdSnAs₂ alloys, elec. props. 3=2915
InAs—In₂Te₃ alloys, reflectivity meas. 3=10910
(InAs)_{1-x}(In₂Te₃)_x system, phase diagram and elec.
In—As—Te system, critical scatt. effects 3=2870
In₂O₃, elec. cond. and thermoelec. power, 180°-460°C 3=2918
InP, metallic transformation at high pr. 3=11211
InSe, Hall effect, elec. cond., 300°-600°K 3=13073
In₂Te₃, reflectivity meas. 3=10910
LaB₆, from reflectivity and absorpt., 15.5 μ 3=20437
Mg₂Pb, p-type 3=10834
Mg₂Sn, elec. props. 3=2922
Mg₂Sn_{1-x}Pb_{1-x}, energy-gap variation rel. to composition 3=869

Semiconducting materials—contd

- Mn ferrite monocrystals, conductivity and Hall e.m.f. 3=20334
Mn silicides, elec. props., Seebeck coeffs. 3=871
MoS₂, thermal cond., dielec. const. 3=8376
Na₂[B₂O₃(OH)₄].8H₂O, proton cond. 3=2904
α-Nb₂O₅, elec. cond. 900°-1400°C 3=8527
Nb₂O₅, rel. to O₂ pressure at 600°-1200°C 3=2923
α-Nb₂O₅, thermoelec. power 3=23026
Nd ditelluride, Hall effect 3=20340
Ni_{1-x}Mn_{2+x}O₄, rel. to composition 3=13078
NiO, carrier mobilities, var. with Li impurity 3=20337
NiO, conductivity electrical, var. with Li impurity 3=20337
NiO, Hall effect and conductivity, electrical 3=20338
NiO, Hall effect, var. with Li impurity 3=20337
Ni_{1-x}O, powdered, electrical resistivity rel. to temp. and Ni content 3=13077
NiO, thermoelectricity, var. with Li impurity 3=20337
NiO-type, carrier mobility, low, polaron theory 3=8526
P, black, crystalline, elec. props. 3=17891
P, resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
PbCl₂, TlCl or BiCl₃ doped, electrolytic cond. 3=17926
Pb₂, elec. cond. rel. to photodecomposition 3=2921
PbO, with cation impurities, conductivity, disorder phenomena and colour 3=13075-6
PbO₂, sputtered films 3=2919
PbS, band structure and free-carrier effective mass, magneto-optical studies 3=10822
PbS, carrier parameters, from photoelec. meas. 3=2977
PbS, carrier recombination capture and lifetime 3=6598
PbS, conductivity, thermoelectricity, pressure depend., up to 9000 kg cm⁻², n.p. 3=22948
PbS, effect of Cu on elec. and carrier props. 3=15593
PbS, elec. conductivity, rel. to pressure 3=10833
PbS, electrical props. rel. to elastic strain 3=10832
PbS, galvanomagnetic effects and band structure 3=868
PbS magnetoplasma reflection studies with polarized light 3=10822
PbS, piezoresistance effect anisotropy 3=6599
PbSe, band structure, rel. to piezoresistance 3=15594
PbSe, controlled deviation from stoichiometry 3=22736
PbSe, donor imperfections rel. to hybrid Frenkel-type disorders 3=2788
PbSe, effective electron mass 3=10904
PbSe, elec. conductivity, rel. to pressure 3=10833
PbSe, electrical props. rel. to elastic strain 3=10832
PbSe, electron energy band structure, rel. to piezoresistance 3=15592
PbSe, galvanomagnetic effects and band structure 3=868
PbSe, p-type, forbidden-band width, press. depend. 3=17889
PbTe, band structure and transport properties 3=10830
PbTe, band structure, rel. to piezoresistance 3=15594
PbTe, conductivity, thermoelectricity, pressure depend., up to 9000 kg cm⁻², n.p. 3=22948
PbTe, donor imperfections rel. to hybrid Frenkel-type disorders 3=2788
PbTe, effective electron mass 3=10904
PbTe, elec. conductivity, rel. to pressure 3=10833
PbTe, electrical props. rel. to elastic strain 3=10832
PbTe, electron energy band structure, rel. to piezoresistance 3=15592
PbTe, galvanomagnetic effects and band structure 3=868
PbTe, helicon oscillation, 4.2°K 3=2920
PbTe, i.r. transmission and reflection, 28°-296°K rel. to carrier concentration 3=10907
PbTe, Landau level studies; Azbel—Kaner cyclotron resonance 3=10831
PbTe, magnetoresistance p-type, 4.2°K, oscills, with increasing mag. field 3=15595
PbTe, mobility meas., 4.2° to 295°K 3=10829
PbTe, oscillations, plasma, helicon 3=13079
PbTe, p-type, Azbel—Kaner cyclotron resonance 3=784
PbTe, resistivity and Hall coeff. 3=867
Pd cobaltite- and pyrite-type compounds 3=21663
Pt cobaltite- and pyrite-type compounds 3=21663
ReSi₂, new semiconductor prepn., props. 3=872

Semiconducting materials — contd

- S, intrinsic and extrinsic, polycrystalline 3=10839
 Sb, carriers, from i.r. absorpt. data 3=4970
 Sb, magnetoelec. effects and band structure 3=8513
 Sb, nonohmic magnetoresistance, thermal origin 3=8512
 Sb—Bi, scattering time at low-temp. 3=10809
 Sb₂S₃, photoconductivity kinetics at room temp. 3=6627
 Sb₂S₃—Sb₂Te₃, elec. and optical props. 3=15585
 Sb₂Te₃, films, elec. and thermoelec. props. 3=8514
 Se, carrier mobilities and trapping centres 3=873
 Se, conductivity, effect of grain size, various dopants 3=22951
 Se, electrical props. rel. to Br and Tl doping 3=17892
 Se, polycrystalline, conductivity rel. to oxidation 3=17893
 Se resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
 Se, states density in forbidden gap 3=13081
 Se—Te solid solutions, Hall effect, conductivity, temp. var. 3=22952
 SiC, α -phase, electronic cond, 300°=1500°K 3=6603
 SiC, hexagonal, hole and electron mobility 3=10838
 SiC, n-type, transient recomb. meas. 3=10840
 SiC, n and p-type, carrier lifetimes 3=15634
 SiC, photoconductivity kinetics 3=8571
 SiO₂ + C, electron field emission 3=21851
 Sn, Hall mobilities, n-type, grey, grown in Sn—Hg 3=17896
 SnO₂, elec. props. analysis 3=2924
 SnO₂, impurity-free, elec. props. 3=17897
 SnO₂, n-type, films, refl. coeff., effect of free carriers 3=6642
 SnTe band structure, exptl. investig. 3=10841
 SnTe, elec. props. rel. to stoichiometry 3=6604
 SnTe, mobility meas., 4.2° to 295°K 3=10829
 SnTe, overlapping of valence and cond. bands 3=25233
 SrB₆ 3=8330
 Te, band structure, from optical meas. 3=13151
 Te, electron lifetime and surface recombination 3=877
 Te, liquid, elec. cond. and Hall effect, up to 850°C 3=9474
 Te, liquid, thermoelec. props. 3=3813
 Te, purified, elec. props. analysis 3=17898
 Te, resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
 Te—Se, liquid solns., thermoelec. props. 3=3813
 TiO₂, elec. conduct., 2°–80°K 3=17895
 TiO₂, electron energy levels, rel. to lattice defects 3=22955
 TiO₂, point-contact diodes 3=10854
 TlSe-type crystals, energy band symmetry 3=15460
 Tl₂Te₃—Bi₂Tl₃, properties 3=18343
 V oxides, energy spectrum, current carriers 3=6605
 V₂O₅, crystals, resistivity meas. 3=2927
 WO₃, rel. to W bronzes 3=13083
 Yb 3=13038
 Yb, 20–40 kbars pressure, elec. props. 3=17899
 Zn-blende materials, absorption spectra near fund. edge 3=10954
 ZnGeAs₂, thermoelec. power, resist., Hall const. 3=8518
 ZnIn₂Se₄, prep. and props. 3=864
 ZnIn₂Se₄, resistivity and thermal e.m.f. rel. to temp. 3=25350
 ZnIn₂Te₄, prep. and props. 3=864
 ZnO, donors and acceptors, e.s.r. 3=13309
 ZnO, electrophotographic props. 3=9629
 ZnO, luminescence and cond. elec., effect of absorbed O 3=6679
 ZnS, carrier distrib. due to inhomog. excitation 3=2928
 ZnS, γ -ray induced conductivity 3=2908
 ZnS lattice absorption, 8° to 420°K 3=10967
 ZnS lattice absorption i.r. bands, shell model applic. 3=10927
 ZnS, luminescence centres 3=13208
 ZnS, ohmic contacts and carrier density 3=8530
 ZnS powders, htd. in Zn atmosphere, carrier conc. 3=13084
 ZnS, surface conduction 3=17900
 ZnS, trapping levels, double activation by Ag and Sm 3=3057
 ZnS, trapping levels, thermoluminesc. data 3=11019
 ZnS : Cu 3=20345
 ZnS, Se; Cu, Cl, recomb. and trapping levels 3=6674

Semiconducting materials — contd

- ZnSb, electrical properties, rel. to temp. 3=25373
 ZnSb, electron states, extremal points, dispersion 3=17684
 ϵ -Zn₃—Sb₂, conductivity electrical and thermoelectricity, 20–470°C 3=20346
 β -Zn₃Sb₂, conductivity, thermoelectricity 3=22956
 Zn₄Sb₃, elec. props. 3=15597
 ZnSe, carrier mobility and shallow impurity states 3=10843
 ZnSe, γ -ray induced conductivity 3=2908
 ZnSnAs₂, thermoelec. power, resist., Hall const. 3=8518
 ZnTe, bound excitons 3=10630
 ZnTe, carrier mobility and shallow impurity states 3=10843
 ZnTe, γ -ray induced conductivity 3=2908
 ZnTe, optical transitions, direct and phonon-assisted 3=10968

germanium

- a.c. field effect, internal field effect on surface 3=21854
 absorption spectrum near fund. edge 3=10954
 alloyed with Ga, hole mobility, conc. and temp. depend. 3=22923
 alloyed with La, Pr and Nd, various props. 3=20308
 avalanche breakdown, negative resistance effects, 4°K (bistable cryosar) 3=13060
 band structure calc., under high pressure 3=22682
 band structure simplified tight-binding approx. 3=22622
 β -conductivity, bombarding electrons 1.5 to 30 keV 3=2885
 bicrystals, boundary layer galvanomagnetic effects 3=22927
 birefringence, by free carriers 3=10912
 breakdown, induced by illum. of compensated material 3=6583
 breakdown, low-field, in n-type, time delay 3=857
 breakdown, low-temp., highly-compensated p-type 3=20310
 breakdown processes, low-temp., rel. to noise 3=853
 capture levels, from photocond. meas. 3=15628
 carrier capture cross-sections, in Cu-doped material 3=17859
 carrier diffusion length, meas. by photocond. modulation 3=20313
 carrier mobility and disloc. scatt. in boundary layer 3=22928
 carrier multiplication, at 9.4. Gc/s 3=15571
 carrier recombination, radiative, at dislocations 3=17860
 carrier recombination, volume, Ca-doped crystals 3=6582
 carrier scattering, on lattice, elec. field enhancement 3=856
 charge carrier recomb. on lattice defects 3=20305
 cleaved surface; gas evolution, conductivity, and V—I characteristics 3=10782
 conductivity about melting pt. 3=21614
 conductivity anisotropy of hot holes 3=2888
 conductivity, due to excess carriers, in magnetic field 3=20299
 conductivity electrical, minority lifetime, dendrite strips 3=18281
 conductivity, rel. to K-ion bombardment 3=17851
 constricted, negative resistance 3=25334
 contact potential differences meas. over surface 3=2896-7
 cross-sections for photon and electron capture 3=15630
 crystal growth, facet formation 3=6823
 crystal surface states, cathode in 2 mol HCl electrolyte 3=17689
 crystallization, interaction of In and Ga dopants 3=20793
 current carrier energy spectrum calc., rel. to spin-orbit coupling 3=2877
 current noise at 20°K after Cu doping 3=10790
 current oscillations, contact controlled 3=15576
 cyclotron resonance of degenerate band holes, quantum effects 3=10771
 cyclotron resonance, emissive negative mass 3=10773
 cyclotron resonance of holes, selection rules 3=6506
 cyclotron resonance of hot electrons 3=10776
 cyclotron resonance of hot electrons in n-type 3=10639
 cyclotron resonance "quantum effects" spectrum, at low temp. 3=10761
 defects, rel. to fast electron and neutron irradi. 3=22725
 degenerate band, cyclotron resonance, quantum theory 3=20150

Semiconducting materials — contd

germanium — contd

- diamagnetic susceptibility, rel. to free carrier generation with light 3=3082
- diffusion and solubility of Te 3=2825
- dipole scattering, rel. to Li compensating impurity 3=10734
- dislocations, elec. props., theory and expt. 3=25335
- dislocations, in torsional deformation, by electron microscopy 3=6514
- dislocations, velocity, as a function of stress 3=6519
- donor spins, relaxation effects 3=10792
- drift mobility, p-type independence of electric field at 77°K 3=20301
- elastic constants, effect of holes, calc. 3=20689
- elec. conductivity in high fields, anisotropy 3=15575
- elec. resistance, temp. coeff. of high-pressure phase 3=859
- electrical field round dislocations; electron mirror obs. 3=10783
- electrode—electrolyte interface, impedance, frequ. depend. 3=18445
- electrode, p-type, effect of surface states 3=21001
- electrolyte—electrode interface, impedance 3=18444
- electron effective mass, As-doped from reflectivity var. with wavelength 3=22930
- electron excitation into cond. band by electrons and by K ions 3=858
- electron excitation into cond. band by electrons and by K ions 3=6588
- electron—hole pairs, recombination processes, neutron effects 3=2884
- electron mobility, temp. var. up to 1000°K, Sb-doped 3=20303
- electron plasma frequ., rel. to optical const. 3=2987
- electron scattering on neutral and ionized impurities 3=17858
- electron states, clean (100) and (111) surfaces 3=13554
- energy bands and u.v. reflectivity line-shape 3=17865
- epitaxial films, on CaF₂, carrier mobility and hole conc. 3=23416
- excess-carrier lifetime, depend. on majority density 3=17848
- excess-carrier lifetime, temp. depend. plateaux, p-type, Ni-doped 3=17847
- excess carrier lifetimes, rel. to carrier speed 3=2891
- extrinsic and intrinsic, noise spectra 3=4913
- Faraday effect, anisotropic, in n-type 3=10778
- Faraday effect in n-type 3=4964
- field-effect modulation of light 3=15572
- films, elec. props. rel. to evaporation parameters 3=20926
- films, electronic interaction with CO 3=25346
- films, evap.—condensation method 3=23511
- films, evap., electronic interact. with O₂ 3=13062
- films, on metals, prep. and props. 3=11317
- films, polycrystalline, flicker effect 3=15540
- films, polycrystalline, structure and electrical properties 3=8507
- forbidden bandwidth, carrier density depend. from diode recombination radiation shift 3=20539
- free-electron i.r. absorption, 77° to 373°K 3=10925
- galvano- and thermomagnetic effects, calc. by scattering theory 3=17855
- grain boundaries in bicrystals, hole distrib. 3=8508
- grain boundary states, n- and p-type bicrystals 3=13064
- Hall effect anisotropy in p-type, 77°-300°K 3=10777
- Hall effect calc. for high elec. field 3=22916
- Hall effect carrier concentration discrepancy, rel. to impurity content 3=17861
- heavily compensated, impact ioniz. of impurities 3=2890
- heavily doped, elec. cond. rel. to temp. in doping region 3=10730
- heavily doped, electron and hole lifetimes 3=10785
- hole capture by Au-ions, p-type, from noise, generation—recombination 3=17852
- hole effective masses, calc. 3=17864
- hole-level spin structure in degenerate band 3=17850
- hole mobility, temp. depend., discrepancy 3=17863

Semiconducting materials — contd

germanium — contd

- hot carrier, energy and momentum relaxation time detm. 3=2883
- hot carrier mobility 3=10793
- hot carrier recombination 3=10784
- hot current carriers, rel. to thermoelec. force and hot electron emission 3=10791
- hot-electron capture by Au centres in n-type 3=25343
- hot electron mobility, iterative quadrature calc. 3=22926
- hot electron noise 3=10770
- hot electrons, effect of phonon distrib. 3=10759
- hot holes, energy distribution function anisotropy 3=25342
- hot holes, energy distrib. function, exptl. detm. 93°-297°K 3=10767
- i.r. absorption, effect of high doping 3=15679
- i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
- impurities, subeutectic solubilities 3=20315
- impurity breakdown, induced, rel. to current oscillations 3=10769
- impurity cond., piezoresistance, magneto-resistance 3=13058
- impurity conduction after Cu doping 3=10789
- impurity conduction, resistivity temp. dependence 3=25344
- "inborn" dislocations and recombination 3=20179
- injected-carrier lifetime, meas. using impurity photo-cond. 3=20307
- injected plasma oscillations 3=25257
- interband Faraday effect, analysis 3=8586
- interface with polymer, surface conductivity 3=20300
- "intermediate" conduction region, band conduction 3=10735
- intra- and intervalley scattering and conduction band tailing 3=10765
- irradiation and annealing damage 3=22859
- junction, p-n, plastically deformed, negative resistance and double injection 3=8534
- Landau levels, cyclotron resonance of holes 3=8505
- lattice absorption i.r. bands, shell model applic. 3=10927
- magnetic props., var. with doping, antiferromag. transformation 3=23135
- magnetoplasma resonance, microwave 3=2893
- magnetoresistance, degenerate n-type, calc. 3=20314
- magnetoresistance, heavily doped, 1.6-4.2°K 3=22929
- magnetoresistance in impurity cond. of n-type 3=4915
- magnetoresistance in impurity conduction range 3=2892
- magnetoresistance, low-fld. in hopping region impurity conduction 3=10775
- magnetoresistance, negative, above 14°K 3=10774
- magnetoresistance in strong fields 3=6581
- majority-carrier mobility on surface 3=15574
- microplasma breakdown 3=25383
- microwave harmonic generation with hot electrons 3=21969
- minority charge carriers extraction, local cond. 3=2886
- mobility anisotropy in n-type at 35 Gc/s 3=17854
- mobility anisotropy and relax. of hot electrons 3=6587
- mobility of hot carriers at 300°K 3=13061
- n-type bicrystal, elec. cond. grain boundary 3=8506
- n-type, elec. cond. 4°-25°K, analysis 3=2894
- n-type, elec. cond. variation in strong pulsating mag. flds. 3=2887
- n-type, fast-states structure at surface 3=6584
- n-type, Sb doped, warm electrons behaviour 3=8499
- n-type, tilt and twist grain boundaries, elec. cond. 3=854
- n- and p-type, photon emission, elec. field induced 3=855
- negative resistance, due to tunnel effect 3=20298
- optical absorpt. due to surface states 3=25251
- optical absorption edge broadening 3=10951
- p-type, forward biased point contact diodes 3=10855
- photocond. max. spectral response, minority carrier diffusion length 3=909
- photoconductivity, carrier generation and recomb. 3=13132
- photoconductivity, extrinsic, with phonon emission 3=13133
- photoconductivity, rel. to Cu impurity 3=2968
- photoconductivity, impurity kinetics 3=20410
- photoelectromagnetic elements prep. by optical polishing 3=4956

Semiconducting materials—contd**germanium—contd**

- photoionization 3=15578
- photomagnetic e.m.f., time and thickness depend. 3=17966
- piezoresistance, n-type, degenerate valley splitting 3=10787
- piezoresistance of diffused layers 3=10753
- piezothermal conductivity, liq. He temp., rel. to dopants 3=10766
- potential distribution across low-index crystal planes, in contact with aqueous solution 3=10788
- quantum transport in n-type, magneto-Seebeck study 3=4914
- quasi-intrinsic, interelectron scatt. meas. 3=20312
- radiation damage from radiative recomb. 3=22862
- recomb., at Ni, 80-250°K 3=6580
- recombination at edge dislocations 3=2898
- recombination at 3rd Cu-level in n-type 3=13057
- recombination, in n-type samples with multicharged impurities 3=20307
- recombination luminescence excitation, by maser 3=20538
- recombination, radiative and cond. band min. 3=2900
- recombined level in n-type electron-irrad. material 3=15570
- resistivity of n-type, pres. and temp. depend. 3=20306
- resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
- resistivity variations, small, in crystals 3=15573
- scatt., electron and hole, n-type, from absorption and vel., u.s. 3=13063
- shallow donors, ground state energies 3=22681
- single crystals, low temp. 1/f noise 3=4912
- solid solubilities of Sb, As or Bi, saturation diffusion expt. 3=3342
- substrates, for epitaxial devices 3=6880
- surface conductance, effects of mag. field 3=13059
- surface elec. props., effect of etching in H₂O₂ 3=2899
- surface point contacts, anomalous characteristics 3=17862
- surface props., effects of chem. treatment 3=15577
- surface recomb. for various injection levels 3=10786
- surface recomb. rate, potential depend. 3=20304
- surface relax., slow non-exponential, model 3=2895
- surface state, electrodes during anodic dissolution 3=16177
- surface states, cleaned and oxidized 3=17856-7
- surface states on cleaved surfaces in p-type 3=6497
- surface states, energy spectrum and effective cross-sections 3=10779
- surface states, fast, due to Cu contamination 3=6585
- surface states, fast, temp. depend. 3=6586
- surface trapping of minority carriers 3=15569
- thermal conductivity, p- and n-type 3=2741
- thermoelectric power, effect of fast neutrons 3=10898
- thermoelectricity, temp. and carrier density var. 3=20426
- thin films breakdown, low-temp., rel. to thickness 3=20311
- trapping of injected carriers at surface 3=22925
- tunnel heterojunctions with GaAs, phonon and polaron interaction 3=6609
- tunnelling, direct and indirect, different temps. 3=22924
- tunnelling, when Sb-doped, strain effects 3=13095
- vacancies, quenched-in 3=22750
- valence band deformation potentials, exptl. detm. 3=10764
- valence band, l.c.b.o. method 3=779
- valence band parameters, by mag. res. absorption spectra, 136 kMc/s 3=25577
- voltage breakdown, low-temp., rel. to thickness 3=10768
- work function, photoemission, surface cond., energy band model 3=4174
- X-ray spectrum short wave limit 3=4919
- Au- and Sb-doped, photoconductivity 3=20411
- Cu levels, 2nd and 3rd, activation energies rel. to temp. 3=17849
- Ge-electrolyte interface, surface states 3=10780
- Ge, fast states, effect of water mols. 3=20138
- Ge-NaOH solution interface, surface conductance 3=10781
- Ge-Si alloys, valence band structure 3=12946
- Ge-Si system, heterodiffusion, electron-diffraction study 3=22808
- Ge-Si(0-34%) alloys, reflection spectra 3=925
- Mn ions, recombination properties 3=17853

Semiconducting materials—contd**germanium—contd**

- Sb- and As-doped, conductivity, rel. to strain 3=22931
- Sb impurity, Lyman series, chemical splitting 3=939
- Tl ions, effective charge and mobility 3=25345

silicon

- band structure, photoemission investg. 3=20318
- band structure simplified tight-binding approx. 3=22622
- birefringence, by free-carriers 3=10912
- carrier diffusion length, meas. by photocond. modulation 3=20313
- carrier lifetime, 85-300°K, n-type 3=20320
- carrier lifetime, rel. to irradi. and annealing 3=22933
- carrier lifetimes, γ -ray effects 3=15581
- carrier removal rate, rel. to neutron irradi. 3=17517
- contact resistance, two crystals 3=10796
- crystals dislocations, carrier recomb., weakened by Cu, precip., O 3=20319
- cyclotron resonance of holes, selection rules 3=6506
- defects by fast electron-irrad., rel. to Li doping 3=22704
- defects, due to electron bombard., depth distrib. 3=22858
- deformation potential, calculation 3=13067
- diffusion, rel. to proton irradi. 3=22825
- donor electron spin-lattice relaxation 3=23244
- donor spins, relaxation effects 3=10792
- elastic constants, electronic effect 3=18162
- elec. resistance, temp. coeff. of high-pressure phase 3=859
- elec. resistivity, effect of thermal-neutron bomb. 3=6589
- electrode, n-type, effect of surface states 3=21001
- electrolyte-electrode interface, impedance 3=18444
- electron emission, hot, from p-n junctions 3=883
- electron-hole pair prod. by α -particles 3=17677
- electron mobility, Hall, for heavy doping 3=25347
- electron scatt. mobility by ionized impurities 3=10800
- electron states, clean (100) and (111) surfaces 3=13554
- electrons relaxation time, cyclotron resonance meas. 3=15580
- energy band structure, reflectance and photoemission 3=4960
- energy bands and u.v. reflectivity line-shape 3=17865
- epitaxial films, doping profiles meas. 3=10650
- Faraday effect, i.r. 3=17985
- Fermi level position, n and p-type, by electron spectr. 3=2758
- field emission, band gap obs. 3=8509
- free electron effective mass detm. 3=10897
- grain boundary states, n- and p-type bicrystals 3=13064
- growth, epitaxial, from SiCl₄ 3=20797
- Hall coeff. rel. to γ -irrad. and temp. 3=20316
- Hall effect calc. for high elec. field 3=22916
- Hall effect carrier concentration discrepancy, rel. to impurity content 3=17861
- heat treatment, resistivity changes and other effects survey 3=15579
- heavy holes, (110) swelling const. energy surface 3=25236
- hole effective masses, calc. 3=17864
- hole mobility, temp. depend., discrepancy 3=17863
- hot carrier mobility 3=10793
- hot current carriers, rel. to thermoelec. force and hot electron emission 3=10791
- i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
- impurities, subeuctectic solubilities 3=20315
- impurity electron states, e.p.r. study 3=4911
- irradiation and annealing damage 3=22859
- lattice absorption i.r. bands, shell model applic. 3=10927
- lattice thermal conductivity, rel. to impurities 3=10610
- levels of defects prod. by electron bombardment 3=6590
- magnetoresistance, degenerate n-type, calc. 3=20314
- magnetoresistance, longitudinal in d.c. mag. fld. to 90 kG 3=10795
- magnetoresistance of p-type in hopping region 3=8511
- mm wave relaxation times, low-temp. 3=10640
- n-type, forward biased point contact diodes 3=10855
- n- and p-type, i.r. absorption rel. to neutron-irrad. 3=3018

Semiconducting materials—contd

silicon—contd

- oscills. due to deep levels 3=15583
- p-n junction problems 3=878
- p-n junction, thermally oxidized, γ -irrad. effects 3=4930
- p-type, nonlinear photo-effects 3=2979
- phonon scattering by small angle grain boundary 3=10794
- photoionization 3=15578
- piezoresistance and piezo Hall effect 3=15582
- piezoresistive props., n- and p-type diffused layers 3=10798
- photoelectric emission, rel. to band bending 3=9834
- photoelectric emission, volume and surface effects, rel. to doping 3=9833
- quantum efficiency, impact ionization 3=20416
- quasi-intrinsic, interelectron scatt. meas. 3=20312
- radiation defects, annealing, rel. to P impurity 3=22934
- recombination centre prod., by quenching, 960-1200°C 3=22932
- recombination luminescence excitation, by maser 3=20538
- recombination radiation, decay, meas. 3=20540
- recombination, radiative mechanism 3=2900
- recombination and trapping, effect of electrons 3=8510
- remnant impurity photoconductivity, in n- and p-type samples 3=23022
- resistivity rel. to pressure up to 3×10^8 kgm cm⁻² 3=2902
- scatt., electron and hole, p-type, from absorpt. and vel., u.s. 3=13063
- semiconductor carrier recomb. at dislocations, weakened by Cu precip., O 3=20319
- semiconducting recomb. centre prod., by quenching, 960-1200°C 3=22932
- semiconducting, oscills. due to deep levels 3=15583
- shallow donors, ground state energies 3=22681
- spin-lattice relaxation of shallow donors 3=25221
- spontaneous fluctuations and lifepath 3=20317
- surface and impurity states by oxide layer tunnelling 3=4916
- surface, minority carrier trapping 3=20415
- surface oxidation, Al-dopant redistribution 3=17866
- surface point contacts, anomalous characteristics 3=17862
- surface states, capacitance meas. analysis 3=10801
- surface states, p-type, charge storage 3=10799
- surface states, time consts., carrier lifetime 3=25348
- surface traps. effect of friction 3=13065
- surfaces potential inhomogeneities; electron mirror obs. 3=10783
- trapping, in n-type samples with high O_2 conc. 3=22935
- valence band, l.c.b.o. method 3=779
- valence band energy, pressure depend. 3=17646
- valence band parameters, by mag. res. absorption spectra, 136 kMc/s 3=25577
- X-ray spectrum short wave limit 3=4919
- zone-refined, p-type, Hall coeff., in pile, and conductivity 3=17867
- Cs doped by energetic ions, in p-type, donor concentration 3=25349
- Fe-B pairing and resistivity changes 3=13066
- Ge-Si alloys, valence band structure 3=12946
- Sb dopant precipitation 3=18361
- Si(0-34%)—Ge alloys, reflection spectra 3=925
- Si, u.v. reflection, spectra, rel. to strong doping 3=18007

indium antimonide

- acceptor levels, deep 3=10824
- avalanche, h.f. oscills., effect of mag. field 77°K 3=6595
- band structure and free-carrier effective mass, magneto-optical studies 3=10822
- carrier mobility, effect of impurity conc. 3=2916
- conductivity about melting pt. 3=21614
- conductivity, 77-450°K, 25-25kOe 3=25367
- e.s.r. and cyclotron resonance, n-type 3=18133
- effective electron mass, 290°-500°K 3=15658
- effective mass, temperature dependence: 5°, 77°, 296°K 3=10823
- electric dipole spin transitions 3=3175
- electric properties, high-pressure effects 3=17886
- electron diffusion coeff. rel. to mobility 3=13074
- electron effective mass, depend. on density 3=17885
- electron-hole plasma, mag. constriction, optical study 3=15590

Semiconducting materials—contd

indium antimonide—contd

- electron-hole scatt. and electron drift vel. 3=25222
- electron and hole scattering 3=17884
- energy exchange bet. hot carriers and lattice 3=22946
- films, undoped, sputtered on glass, structure and elec. props. 3=3357
- free-carrier absorpt. at liquid-He temps., n-type 3=25385
- free-carrier i.r. absorpt., deformation-potl. const. 3=23071
- Hall coeff., independent of mag. field, 0.1-22 kOe Se-doped 3=17883
- Hall effect at room temp. 3=840
- Hall effect, 77-450°K, 25-25kOe 3=25367
- helicon wave propagation, at room temp. 3=10827
- hot electrons, drift velocity meas. 3=8386
- impurity electron states, e.p.r. study 3=4911
- lattice scattering of electrons, n-type 3=10820
- lifetime of d-band holes 3=8525
- magnetic properties, theory 3=23139
- magneto-absorption; valence band anisotropy, meas. above absorption edge 3=10924
- magneto-optical oscillations in n-type 3=10917
- magnetoplasma reflection studies with polarized light 3=10822
- magnetoresistance, quantum oscillations in strong pulsed mag. fields 3=17888
- magnetoresistance, var. with field, up to ~300 kOe 3=17887
- metallic transformation at high pr. 3=11211
- n-type, effects of r.f. radiation 3=6634
- oscillations, electron-hole injection plasma, p-type, 77°K 3=15591
- overlap bet. cond. and heavy-hole band 3=22684
- p-type, magnetoelec. props., analysis 3=22947
- p-type, surface conductance at 77°K 3=2917
- photomagnetoelec. e.m.f. in alternating field at room temp. 3=6638
- photomagnetoelectric phenomena, at room temp. 3=17881
- plasma distrib., self-pinched, microwave probe obs. 3=25366
- plasma, drifted, transverse e.m. waves 3=17693
- plasma (electron-hole) injected, in longit. mag. flds 3=10821
- plasma, electron-hole, thermal pinching 3=25261
- plasma pinch, sound-wave generation at sufficiently high currents 3=6597
- radiative recombination 3=10825
- recombination radiation from avalanche effect 3=4924
- recombination radiation in strong elec. fields 3=4923
- reflection spectra rel. to band structure 3=925
- reflectivity meas. 3=10910
- thermal cond. change in mag. field 3=1850
- thermal conductivity (1.2-4.0°K) 3=4830
- thermal props., bonding 3=2914
- transport phenomena, in n-type 3=17882
- valence band, l.c.b.o. method 3=779
- X-ray spectrum short wave limit 3=4919
- InSb—In₂Te, alloys, reflectivity meas. 3=10910

Semiconductors

See also Magnetoelectric effects; Photoconductivity; Photovoltaic effects.

- absorption, acoustic waves 3=17649
- absorption, light, by conduction electrodes in strong electric field 3=20459
- absorption of sound in piezoelec. materials 3=17653
- acoustic amplific., resonant, by cond. electrons 3=20093
- acoustic amplification 3=8354
- acoustic space-charge wave propagation 3=22920
- acoustic wave amplification, by electron-phonon interaction 3=20092
- activation energy, chemical interpretation 3=2864
- alloy systems, critical scatt. of cond. electrons 3=2870
- alloys, lattice thermal conductivity, theory 3=25207
- alloys, thermal conductivity at high temps. 3=10616
- amorphous, energy bands and impurity levels 3=10747
- amorphous, local fluctuation levels 3=20283
- apparatus to meas. temp. depend. of elec. cond. up to 1000°C 3=24159
- Azbel'—Kaner cyclotron resonance 3=10638

Semiconductors—contd

- band structure, with impurities, perturb.-moment method 3=22683
- band theory, review of recent progress 3=10746
- bicrystals, grain boundary thickness detm. 3=2816
- birefringence, by free-carriers 3=10912
- Bloch wave transmission through crystal interfaces 3=10736
- bonds, nature 3=2687
- breakdown, time behaviour, theory 3=15561
- Brillouin zone, selection rules, time-reversal 3=10745
- carrier-carrier scatt., rel. to mobility 3=2857
- carrier-density fluctuations involving space-charge limited transport 3=10750
- carrier energy distrib., in presence of fast electron source 3=17829
- carrier lifetime, meas., by microwaves, high cond. 3=20296
- carrier lifetime, n-type with local centres 3=8500
- carrier lifetime rel. to surf. recombination 3=2868
- carrier lifetimes, short, meas. 3=6579
- carrier scattering, Hall current detm. 3=17845
- carrier, sign, concn. and mobility, meas. method 3=15559
- cathodoluminescence, trapping mechanism 3=3064
- chemical formation by oxidation and reduction, effect of equilibrium conditions 3=25824
- chemisorption rate laws 3=1390
- combined electron resonance 3=15931
- composition effects 3=25340
- conductivity, electrical, calc., allowing for impurity ions 3=20288
- conductivity, electrical, impurities, low temperature 3=22910
- conductivity, electrical, impurity, low temp., calc. 3=20292
- conduction, hot carrier, freq. depend. 3=13048
- conductivity meas., epitaxial and bulk, four-point probe 3=25341
- conductivity, measurement, five probe method, theory 3=21674
- conductivity, nonequilib., decay, two recomb. centres, calc. 3=17833
- conductivity variation, cross-sectional, meas. 3=17844
- conference, Exeter (1962) 3=6566
- conference, Exeter (1962) 3=6567
- conference, Prague 1960, closing speech 3=2861
- conference, Prague 1960, closing speech 3=2862
- conference, Prague 1960, summary talk 3=2860
- Corbino expt. using cylindrical mag. field, galvanom. and thermomag. effects 3=1925
- covalent bonds 3=10566
- crucible material, use of vitreous C 3=21181
- crystal excitons, drag by charge carriers, calc. 3=17691
- crystal growth, Czochralski, distrib. of additions 3=25670
- crystal growth, Czochralski, impurities, two-crucible control 3=25671
- crystal potential and energy bands, exchange and correlation effects 3=6578
- crystals, magnetoelectric and thermomagnetoelectric effect, calc. 3=6565
- current carrier energy spectrum calc., rel. to spin-orbit coupling 3=2877
- current fluctuations, near non-equilibrium stationary state 3=15558
- current instability, self-excitation 3=20284
- current oscillations, appearance 3=17830
- currents, space charge limited, with blocking contacts 3=8501
- cyclotron resonance, Azbel'—Kaner and Voigt-type, theory 3=785
- cyclotron resonance, quantum transport eqn., eqn. treatment 3=15560
- cyclotron resonance in varying magnetic field 3=2776
- daltonides, anomalously composed, theory 3=10762
- degenerate bands, thermomagnetic effects, theory 3=17832
- degenerate, disordered, theory, 1930 → present 3=13045
- degenerate, energy levels and optical props. 3=20454
- degenerate, theory 3=10739
- degenerate, thermo-e.m.f. and Nernst effect, rel. to mutual electron and phonon drag 3=20290

Semiconductors—contd

- diamond-type, free dangling orbitals on clean (111) surfaces 3=10748
- dielec. const. by intrinsic activation energy 3=847
- dielectric function, wave-number-dependent, calc. 3=6577
- diffusion with interstitial—substitutional equil. 3=20225
- dipole scattering 3=10734
- dislocation det. on cleavage surfaces by etching 3=4877
- dislocation mobility and kink nucleation theory 3=17730
- dislocations, elec. props., theory and expt. 3=25335
- dispersion theory, interband and plasma effects 3=10744
- e.m. wave propag., plasma, appl. 3=6568
- effective mass measurements, review 3=10743
- elastic constants and lattice vibrations, diamond-type materials 3=1214
- elastocaloric effect in many-valley type 3=4832
- elec. current fluctuations, theory 3=6572
- electric cond., h.f., of degenerate semicond. 3=25337
- electric field, var. with electron conc., large impulse currents 3=22919
- electrical cond. due to self-activation 3=17842
- electrical conduction, sign, meas., liquid He temp. 3=16883
- electrical conduction, transverse rel. to electron and phonon mutual dragging 3=4901
- electrodeless meas. techniques 3=342
- electrodes with two electrolyte contacts 3=18446
- electro-mechanical effect, resistance to indentation rel. to potential 3=23365
- electron chemical potential, rel. to band theory 3=2873
- electron-electron scattering, theory and expt. 3=10732
- electron emission, field, energy distrib. rel. to effective mass 3=2014
- electron-hole scatt., semiconds. with band-gap impact ionization 3=25222
- electron-phonon interaction and energy spectrum, degenerate 3=20129
- electron relax., donor, by spin-orbit interact. 3=25219
- electron scattering on impurities, theory 3=2867
- electron states and phonon spectra from i.r. spectra 3=15667
- electron temp. fluctuations and noise, high fields 3=17835
- electron "temperatures" direct meas. 3=10730
- electron tunnelling in junctions, theory 3=6608
- electronic spectra, low-temp., papers in conference, Kiev, 1961 3=24124
- energy spectrum for low mobility 3=15563
- energy structure of complex semiconductors calc. 3=15568
- excess carrier conductivity, kinetics, at high generation levels 3=22911
- excitation, by e.m. waves, forming "helicon" particles 3=6568
- excitons, spectroscopy, for laser appl. 3=7330
- Faraday effect, general formula review 3=23047
- Faraday effect, microwave, and guided waves 3=2875
- Fermi level calc. with electronic computer 3=20293
- Fermi level, surface, rel. to band gap, barriers 3=20134
- ferro- and antiferromagnetic interactions 3=20565
- ferromagnetic, spontaneous Hall effect, theory 3=22918
- field emission in mag. field 3=16973
- field emission, spectrometer 3=5691
- films, forbidden bandwidth, thickness and temp. depend. 3=17843
- fluctuations, electrical, generation-recombination, Klaassens expression, corrections 3=17834
- fluctuations, electrical, l.f., electron-hole plasma instabilities 3=20281
- fluctuations, electrical, l.f., magnetohydrodynamic carrier motion 3=20280
- generation-recombination noise and warm electrons 3=64
- glasses, Fermi states, calc. 3=20918
- group IV and III-IV cpds., band structure 3=10625
- Hall effect for high elec. field in many-valley semicond. 3=22916
- Hall effect for low mobility, theory 3=15566
- Hall effect, theory, carrier drag effects 3=6575
- Hall mobility and magnetoresistance due to hot carriers in strong mag. fields 3=10760

Semiconductors—contd

- heavily-doped, band structure 3=10741
- heavily doped, theory 3=17831
- "helicon" mode propagation for metre and decametre waves 3=22921
- high-field and space-charge, review 3=13055
- homogeneity anal. using volume photo-e.m.f. 3=15567
- hot electrons, distrib. functions and ioniz. rates 3=6573
- hot electrons, effect of phonon distrib. 3=10759
- hot electrons, symmetry behaviour 3=13054
- hot electrons, theory 3=17828
- impact ioniz. of centres by electrons 3=8502
- impure, band structure, Thomas—Fermi approach 3=17678
- impure, energy bands, perturbation meth. calc. 3=10742
- impurity centres and structural defects, activation energies 3=20294
- impurity conduction, localized spins and negative magnetoresistance 3=10737
- impurity electron states, e.p.r. study 3=4911
- impurity ion transport in mag. field 3=6570
- impurity levels theory, rel. to polariz. effect of medium 3=2869
- impurity states, electron—phonon coupling 3=10733
- impurity-type, generation—recomb. noise 3=22914
- inhomogeneities, rel. to fast neutron irradi. 3=22909
- inhomogeneous, charge, energy transport for hot, cold carriers 3=10756
- injection, double, two-dim. theory 3=17838
- ion drift in electric fields 3=13052
- ionic, conductivity, in strong crossed elec. and mag. fields 3=25339
- ionization of local levels by elec. fields 3=15453
- ionized impurity scatt., partial-wave method 3=25338
- lattice absorption i.r. bands, shell model applic. 3=10927
- lattice mag. susceptibility, theory 3=11022
- lattice vibrations, review 3=10576
- layers, epitaxially grown, analysis 3=8813
- lifetime measurements, pulse generator circuit 3=12050
- local-centre parameter meas., photoelectric 3=20295
- local levels, photoelec. study 3=2878
- low mobility kinetic theory 3=15557
- low mobility transport phenomena, review 3=10738
- low temperatures, review 3=2
- magnetic field effects, use of resist. network 3=13050
- magnetic props. with nonparabolic bands 3=23139
- magnetoelectric effects theory 3=6576
- magneto-optical effects, interband, semiclass. dispersion theory 3=4963
- magneto-optical effects, with polarized i.r. 3=14377
- magnetoresistance, due to carrier density change 3=20278
- magnetoresistance oscillations in strong mag. field 3=6569
- magnetoresistance, weak-field, for hopping cond. 3=15564
- magnetothermal effects, longitudinal, in strong fields 3=2866
- magnetothermal effects, standard and Kane band models 3=20289
- majority carrier sign determ., by hot-point probe 3=8498
- melting point formula, rel. to electronic processes 3=10609
- microwave reflection, theory and expt. 3=23043
- mixed conductors, l.f. characteristics 3=2874
- mobility change through temp.-dependent mass 3=848
- molecular crystals, Hall effect and carrier mobility 3=2911
- multi-valley, mobility in medium fields, theory 3=845
- negative resistance 3=8535
- negative temp. states, production method 3=2863
- negative temps., statistics 3=17839
- Nernst figure of merit, optimization criteria 3=20257
- neutron irradi. effect on elec. props., review 3=25336
- noise as a queuing phenomenon 3=20282
- nonequilibrium carrier density, effect of recombination 3=6571
- non-equilibrium distributions 3=10749
- nonlinear optical processes 3=927
- nonlocal transport and cuspidal surface mobility 3=20285
- non-ohmic behaviour, acoustoelec. current 3=2876
- nonpolar, elec. dipole scatt., Born approx. calc. 3=2872

Semiconductors—contd

- nonspherical and nonquadratic energy bands, transport 3=17840
- non-steady state cond., rel. to band and hopping processes 3=10735
- optical absorption, elec. field effects 3=13160
- optical absorption in uniform field 3=15664
- optical and magneto-optical effects as examination tools 3=2994
- optical and nonradiative transitions, theory 3=23032
- optical properties, review 3=10906
- optical reflectance, plasma oscill. theory 3=8584
- oscillating electron—hole plasma, rel. to a.c. origin 3=850
- oscillations, elec. rel. to electron—hole instabilities 3=10730
- oscillator phenomena 3=2879
- oscillator effect, mechanism and possible applications 3=10758
- p—n transitions, effect of adhesion levels, theory 3=2865
- parameters meas., contactless method 3=15566
- particle detectors, time resolution 3=19510
- phonon drag on charge carriers, theory 3=25248
- phonon-drag thermoelec. power, longitudinal case 3=25424
- photoconductivity, impurity, rel. to capture levels 3=15628
- photoconductivity kinetics, impurity and intrinsic 3=2968
- photoelectric emission, review 3=19312
- photoelectric internal effects 3=2967
- photoelectromagnetic effect meas., apparatus 3=7411
- photoelectromagnetic effect, theory 3=6637
- photo-emission, law 3=7633
- photomagnetoelectric effect with gap gradient 3=17951
- piezoelectric, acoustoelectric effects, rel. to frequency 3=10755
- piezoresistance of diffused layers 3=10753
- plasma, drifted, transverse e.m. wave propag. 3=17693
- plasma oscill., electron—hole, l.f. 3=15476
- plasma, pinched, moving, Doppler effect, e.m. waves 3=17827
- plasmas, growing helical density waves 3=8504
- plasmas, helical instabilities, calc. 3=13051
- plasmas, helical instabilities, theory 3=8410
- polar, many-valley, mobility and thermoelec. power 3=2871
- polar semiconductors, electron mobility, conc. and temp. depend. 3=22912
- polyacrylonitrile, conducting mechanism 3=20341
- polymers, inorganic, Fermi states, calc. 3=20918
- potential distrib. meas., analogue method 3=17907
- proton—neutron damage correl. 3=25308
- Raman effect, first-order lattice vibration, theory 3=25448
- recombination for photo-excitation from impurities 3=849
- recombination mechanism 3=22917
- recombination processes, effect of excited multielectron centres 3=4910
- recombination processes through multielectron centres 3=10752
- recombination statist. for Auger effects 3=13090
- recombination through excited states, transient life-time 3=20287
- relaxation times meas. near 10^{-8} sec. 3=16885
- resistivity meas., four-point probe 3=24160
- Shubnikov—de Haas oscillations, rel. to spin 3=844
- small injections, graphical data analysis 3=20279
- space charge, field and potential distrib. 3=10757
- space-charge-limited currents, with traps 3=8503
- space-charge zones near surface, carrier motion 3=2859
- spectra, i.r., and electron states and phonon spectra 3=15667
- steady-state injections in p-type, theory 3=10751
- structures, current—voltage relations 3=2880
- superconductor, semiconductor model, tunnelling effect 3=1894
- supersonic carrier drift, rel. to plasma sound wave generation theory 3=22915
- surface charge, potl. profiles in space-charge region 3=22913
- surface charge rel. to surface potential 3=13049
- surface effects on signals in waveguides 3=19454
- surface Fermi level, rel. to band gap, barriers 3=20134

Semiconductors—contd

- surface layers, transverse impedance rel. to freqn. 3=13053
- surface transport and thermoelectric power 3=2858
- survey of outstanding problems 3=843
- synthesis, oxygen reactions, chem. potential series 3=3391
- thermal cond. meas. in mag. field 3=1850
- thermal expansion, effect of impurities 3=17664
- thermionic emission, electrons and positive ions, laser induced 3=24333
- thermodynamic activity, and intrinsic ionization equilibrium 3=17836
- thermoelectric emission in strong fields 3=2982
- thermoelectricity, for low mobility 3=25425
- transport, experimental, recent developments, review 3=10730
- transport phenom. with non-equil. concns. 3=17841
- transport phenomena for low mobility 3=15562
- transport theory, review 3=10731
- transport theory, warped energy surfaces 3=20286
- transverse mag. effects calc., weak-field approx. invalid 3=10754
- trap energy distrib. from glow curves, theory 3=846
- trapping level parameters in CdS-type, meas. 3=25231
- tunnel effect, analogy with optical incomplete reflection 3=17837
- tunnel effect with impurity scattering 3=20291
- two-band, thermoelectric figure of merit, theoret. bound 3=17967
- II—IV and III—V cpds, Cu impurities, excited states 3=10810
- u.s. amplification in crossed fields 3=12921
- very degenerate, band structure, theory 3=10740
- Voigt effect, due to free carriers 3=6643
- warm electrons distrib. function, effect of e—e interact. 3=8499
- with zero energy barrier, equil. props. 3=25333

Series

- asymptotic expansions, from generalized series 3=9321
- celestial mechanics, coordinates of unperturbed motion, convergence 3=23658
- generalized asymptotic series 3=3704
- related to hypergeom. functions F_1 and ϕ , 3=18688
- summation, divergent, in time meas. 3=11668
- Taylor's, in zero-point energies calc. 3=12794

Sferics

See Atmospherics.

Shock tubes

- boundary layer flow, tracer study 3=7285
- boundary-layer separation and shock bifurcation detection 3=18903
- bursting-diaphragm, general-purpose 3=18902
- 8 x 2 in., instrumentation 3=1763
- electric arc-driven 3=16702
- electromagnetic, origin of driving force 3=11859
- e.m., wave attenuation by radiative losses 3=1758
- explosion driven 3=7280
- hydrodynamic tube, with liquid driven by gas 3=11858
- ionization probes use, design 3=1762
- magnetic, with variable driving field, theory 3=202
- plasma, discharge between coaxial cylinders, velo. meas. 3=14252
- precursor photoionization 3=9550
- recombination rates of atoms, meas. 3=18905
- temperature measurements in the OH* Σ band system calc. 3=7281
- transition from laminar to turbulent boundary layers 3=7283-4

Shock waves

- See also Detonation; Explosions; Supersonic flow.
- acceleration in plasma 3=18897
- in air, rarefied, formation, propag. 3=14251
- approximation of point detonation by spherical radiator 3=14248
- for arc, C, temp. meas. 3=19225
- Armco iron, elastic—plastic props. 3=9540
- in Armco iron, radiographic study 3=9549
- body of revolution, nose, pressures and temps. 3=197
- Boltzmann eqn. soln. using Burnett approach 3=14244

Shock waves—contd

- Boltzmann eqn., using distrib. function formula 3=21478
- breakdown wave propagation, theory 3=1956
- brittle medium, on explosion, front 3=23970
- in chemical kinetics, use of reflected waves 3=13594
- in collision-free plasmas 3=12216
- comets, excited by solar particles, theory 3=9181
- conical supersonic flow, higher-order approx. 3=159
- curvature of shock fronts in shock tubes 3=18904
- curvilinear, flows behind wave front 3=16697
- cylindrical, exact analytic soln. 3=3851
- cylindrical, precursor electrons ahead 3=1759
- cylindrical, spherical, in monatomic cond. fluids 3=21965
- demonstration 3=9546
- detonation, gaseous, laminar, generation structure 3=18895
- detonation vel., condensed explosives 3=20992
- detonation velocity rel. to front shape 3=3849
- detonation waves from conc. high explosives, parameter calc. 3=11853
- detonation waves in gaseous HN₃, calc. of characteristics 3=3850
- detonation waves near hot boundary 3=18896
- detonations, large rate parameters 3=21487
- diffraction of oblique wave 3=21482
- diffraction of plane wave 3=21481
- diffraction round contours of arb. shape 3=23972
- electrically driven, microwave studies 3=21488
- electrodynamic excitation procedure 3=1757
- electromagnetically driven, luminosity behind, origin 3=7282
- e.m. driven, attenuation, radiative losses 3=1758
- e.m. field interaction 3=16945
- e.m., in gyromag. media 3=24466
- e.m. produced, luminous phenomenon, refl. study 3=23971
- excited atom distrib., radiation meas. 3=14243
- exploding wire, streak interf. obs., two wavelength, temps., electron conc. 3=18900
- from exploding wires, review. 3=199
- explosion of ionized air channel 3=4124
- formation, and 1st and 2nd order discontinuity propagation 3=21483-4
- formatn., weak disturb. reflectn. from sonic line. 3=196
- formatn. weak disturb. reflectn. from sonic line 3=5489
- gas, internal relaxation or zero energy reactions, shock wave 3=23921
- gas monoatomic, smoothing-out asymptotic law 3=5488
- gas, ultrarelativistic; attenuation, interact. with rarefaction wave 3=7236
- gases, detonation wave velocity meas. 3=198
- gases, viscous and heat-conducting, hyper-sonic flow. 3=160
- homology parameter calc. for high Mach number 3=9544
- hydromagnetic, "collision-free" rel. to turbulence 3=7540
- hydromagnetic, with transverse field and viscous dissipation, structure 3=11855
- hypersonic shock layer, m.h.d. support 3=18901
- ideal gases, absence of temperature gradient 3=16696
- impact, metal, hypervelocity 3=21486
- instability, anisotropic, collisionless wave in rarefied plasma in mag. field 3=16930
- interactions, triple, Mach effect, theory 3=3847
- interferometer profile determ., e.m. waves, Fabry—Perot 3=21479
- ionization behind, kinetics 3=19169
- in ionized gases, magnetically driven 3=7278
- in iron and steel, rarefaction 3=3852
- laminar and turbulence theories in mag. field 3=21844
- leading edge of shock-induced boundary layer 3=1753
- longitudinal, quasi-transverse, in elastoplastic medium 3=1749
- longitudinal in plasma columns 3=7530
- low-pressure, test time reduction 3=21492
- luminous phenomena, in e.m. shock tubes, interpretation 3=16701
- magnetic annular shock tube, deviation from one-dimensional model 3=2100
- magnetic, in plasma 3=7529

Shock waves—contd

- magnetogasdynamic 3=12305
- magnetohydrodynamic, collision-free struct. 3=2107
- magnetohydrodynamic, evolutionary conditions 3=7691
- magnetohydrodynamic flow of weakly dissipative fluids, finite conductivity 3=18893
- magnetohydrodynamic, from expansion of piston 3=21776
- magnetohydrodynamic, rel. to plasma prodn. 3=7684
- magnetohydrodynamic, steady 1-dimens. flow, fast and slow shocks 3=17041
- magnetohydrodynamic structure, steady-state 3=2106
- in magnetohydrodynamics, anisotropic relativistic case 3=24453
- m.h.d., Fermi acceleration of particles 3=9910
- measurements, effect of test-generator distance 3=7273
- metals, thermodynamic description 3=9547
- non-Hugoniot, weak, structure 3=16694
- nonequilibrium phenomena, survey 3=16695
- nonuniform propagation 3=18898
- normal, rel. to blunt-body flow 3=5457
- in perfect gas with Sutherland viscosity law, hypersonic approx. 3=11854
- photograph, ultrahigh-speed camera 3=3904
- plane shock layer, structure, kinetic model 3=1754
- in plasma, bimodal distrib. 3=21489
- plasma, collisionless, in weak mag. field 3=12132
- plasma columns, unpinch geometries 3=1991
- in plasma, compressed by azimuthal currents 3=7564
- in plasma, converging, theory 3=12218
- in plasma generation in collapsing cylindrical shell 3=12219
- plasma generator, jet, structure 3=9809
- plasma, high-temp, dense 3=5661
- in plasma pinch, linear, collisionless 3=14586
- in plasma, strong waves in transverse mag. field 3=7541
- in plasma, strong waves, similarity solution 3=7542
- in plasma, transient pinched 3=19263
- in plasma, two-fluid model 3=1973
- plasma wave phenomenon, fast dynamical 3=1955
- plasma, weak waves, structure 3=1980
- propagation at moderate strength, theory 3=14249
- propagation, developments, conference 3=11675
- propagation in a heat-conducting gas 3=18899
- propagation in inhomogeneous medium 3=3848
- propagation in solids and compactible media 3=11856
- propagation inside stars 3=23692
- propagation in switching tubes by microwave pulses 3=3846
- propagation, qualitative differences from linear waves. 3=200
- radiation intensity, before shock-wave emergence 3=21480
- radiation-resisted shocks, analytic soln. 3=1761
- radiation-resisted, structure predictions 3=18894
- resonator on shock platform 3=14247
- review, theory 3=18892
- shape and parameters, by explosion, in non-uniform medium 3=21485
- shock tubes, microwave technique appl. to ionization 3=1934
- in solid bodies, oblique collision, irregular conditions 3=1756
- solids, anelastic, review 3=21477
- spark channel decay after current passage 3=9748
- spark channel heating 3=21740
- spectra, effect of shock-machine loading 3=201
- from spherical cavities in materials strained beyond the elastic limit 3=7279
- stability of step shocks 3=1760
- in stars, front-to-back ratios 3=23690
- stellar atmosphere, inhomogeneous 3=3602
- stellar atmospheres, dissipation theory 3=9235
- stellar atmospheres, stationary wave propag. 3=5263
- striations, as plasma-acoustic waves 3=19211
- from supersonic flight, noise prodn. 3=14245
- supersonic flow past delta wing 3=162
- for temperature meas., arcs, C 3=19225
- temperature meas. by spectral-line reversal 3=14246
- u.v. radiation analysis 3=7274

Shock waves—contd

- velocity in elec. arc 3=16920
 - velocity, meas. by multiple flash gas 3=7275
 - velo. meas., plasma discharge between coaxial cylinders 3=14252
 - vibrational relax., calc. 3=23969
 - water, detonation pressure and eqn. of state 3=1751
 - in Al, nonhydrodynamic attenuation 3=21490
 - Al, propagation 3=11856
 - Ar, bimodal model, rel. to intermol. forces 3=1755
 - Ar, normal and oblique, equilib. ionization calcs. 3=23973
 - Ar, structure meas. by microwave techniques 3=9545
 - D, ionization fronts, R-type 3=7277
 - H, atomic, structure of shock front 3=21491
 - He, bimodal model, rel. to intermol. forces 3=1755
 - He, e.m. driven, electron density and temp. 3=1752
 - He, e.m. driven, of Mach number 10-100 3=7276
 - He, equilibrium state behind 3=16698
 - He, equil., specific heats behind front 3=16699
 - in N₂, props. behind incident and reflected waves 3=21493
 - in O₂, props. behind incident and reflected waves 3=21493
 - W, parameters rel. to initial densities 3=5487
- effects**
- acetone, double refraction 3=7205
 - aerosol coagulation, oil mist, periodic waves 3=23555
 - air, ionization 3=7431
 - air, ionization rate, theory 3=12074
 - air, NO band emission near 1 μ 3=3836
 - alkali halides, compressibility, high-press. 3=18179
 - booms from aircraft in manoeuvres 3=16693
 - butene-2, cis-trans isomerization in shock tube 3=16160
 - charged particle accel., energy spectra 3=21087
 - detonation initiation of homog. explosives 3=11348
 - detonation in water, luminosity 3=21379
 - drops, breakup by air blasts 3=23859
 - dust dispersion, initial stages 3=9543
 - flow of polyatomic gas 3=21424
 - gaseous plasma, visible light emission 3=21488
 - glass breakage by sonic booms 3=16692
 - hydrazoic acid, luminescence 3=12876
 - interactions, two waves in same direction 3=14250
 - melting 3=24108
 - methanol, double refraction 3=7205
 - molecular dissociation and recombination behind shock wave 3=11857
 - molecular dissociation behind shocks 3=22604
 - n-heptane, double refraction 3=7205
 - in plasma, elec. impedance of immersed electrodes 3=21760
 - plasma, moving, nonlinear mag. interact. 3=9773
 - plasma prodn. with high electron density 3=12181
 - plasma, Kr, coupling of microwaves 3=16943-4
 - plastic flow in metals on explosive loading 3=1224
 - powdered solids, thermal excit., spectroscopy 3=24018
 - shell, elastic, cylindrical, transient response 3=7260
 - shock tube, single pulse 3=16160
 - shock tube study of O atom recombination 3=13595
 - slicks on Lake Huron 3=7187
 - spectra excitation, review 3=11912
 - 2, 2, 4 trimethylpentane, double refraction 3=7205
 - underground cavities 3=16194
 - vibrations of elastic cylindrical shell 3=18881
 - water, double refraction 3=7205
 - A, insulating-boundary thickness behind shocks 3=24456
 - Cl₂, dissociation 3=25147
 - CO, gas, radiation spectrum 3=11835
 - CO, vibrational relaxation meas. 3=7243
 - CO₂, dissociation rate in shock tube 3=15389
 - CO₂, gas, radiation spectrum 3=11835
 - Cs vapour, ionization processes study 3=1930
 - Cu, residual temps. 3=21597
 - α -Fe, screw dislocations 3=4872
 - Kr, plasma, coupling of microwaves 3=16943-4
 - N₂⁺, first negative band intensity behind shock waves rel. to pres. 3=4756
 - N₂ gas, radiation spectrum 3=11835
 - NO₂, with Ar, thermal emission of mol. 3=720
 - O₂, and intramol. oscill. relax., temp. var., and intermol. repulsion 3=12881

Shock waves — contd**effects — contd**

- O₂ gas, radiation spectrum 3=11835
- O₂, propag., and intramol. oscill. relax., temp. var., and intermol repulsion 3=12881
- Se, grey, rel. to elec. cond. 3=830
- TiCl₄-Ar mixtures, neutral Ti emission behind waves 3=11836

Shot noise

See Fluctuations, electrical.

Showers

See Cosmic rays, showers and bursts.

Silicon

See also Semiconducting devices; Semiconducting materials, silicon.

- abraded surfaces, electron microscope study 3=3353
- abrasion, surface damage 3=16010
- absorption band temperature variation, rel. to O impurity 3=23077
- absorption edge, intrinsic, heavy doping effect 3=15688
- adsorption of H, i.r. internal reflection study 3=18397
- anisotropic solution, light figures study 3=13410
- anti-Schottky defects 3=12963
- band structure, electron, by photoelectric emission 3=6491
- bicrystals growth, Dash pedestal method 3=11235
- bremstrahlung spectrum, isochromat structure 3=8611
- cleaved surfaces, structural props. 3=23383
- compressibility, rel. to temp. 3=18178
- contact resistance, two crystals 3=10796
- crystal dislocations, electron microscope exam. 3=22784
- crystal, electron diffraction pattern, unknown streak 3=1287
- crystal etching and growth bands, non-uniform impurities, n-type 3=20782
- crystal growth, by SiHCl₃ reduction 3=18275
- crystal growth, epitaxial 3=16046
- crystal growth, facet formation 3=6823
- crystal growth, floating zone 3=18276
- crystal growth, floating zone, induction vacuum apparatus without quartz 3=25677
- crystal growth, separated from gas phase, atomic significance 3=18268
- crystal lattice optical and acoustic oscill. frequ. 293°K 3=15419
- crystal phase transformations, rel. to pressure 3=18228
- crystals, anomalous transmission of X-rays 3=13185
- crystals, etching, thermal 3=16030
- crystals, neutron diffraction spin-orbit interaction 3=18294
- cyclotron resonance under uniaxial strain 3=8414-15
- diffusion of As, 1100°-1350°C meas. 3=10689
- diffusion of B, distrib. 3=22822
- diffusion of B through oxide layer 3=10690
- diffusion of B through SiO₂ layer, anomalous 3=17789
- diffusion of P, fast mechanism 3=2832
- diffused P distribution 3=2833
- diffusion, in liquid cast Fe, by electrolysis 3=5431
- diffusion of Zn, in elec. fields 3=17790
- diffusion, rel. to proton irradi. 3=22825
- dislocation kink motion, rel. to internal friction 3=10663
- dislocation obs. by heat treatment in different vapours 3=20180
- dislocations, discrete stress field 3=6518
- dislocations, interaction with vacancies 3=6517
- dislocations in single crystals 3=797
- edge dislocations, climb induced by Au 3=17715
- effects of 100 kV H⁺ and He ion bomb. 3=10708
- elastic constants, electronic effect 3=18162
- electron diffr., energy analysis of pattern 3=16058
- electron emission, field, direct energy meas. 3=4176
- electron emission, field, energy distrib., strong p-type 3=12232
- electron emission, field, tips 3=12231
- electron energy losses in very thin films 3=20154
- electron scatt. at cleavage surfaces 3=4857
- e.s.r. of centres due to neutron irradi. 3=2849
- e.s.r. of embedded V³⁺ and Fe⁰ atom 3=20639
- e.s.r. surface centres due to heat treatment 3=5045
- electropolishing technique 3=23501

Silicon—contd

- energy band structure, reflectance and photo-emission 3=4960
- epitaxial films, thickness meas. by i.r. interference 3=1650
- epitaxial, stacking faults structure, origin 3=10680
- evaporation, in vacuo and film fabrication 3=20927
- expansivity, negative, below 120°K 3=773
- field emission 3=24332
- films, characteristic energy loss of 50 keV electrons 3=14661
- films, epitaxial, growth and defects 3=5091
- films, epitaxial, vacuum evap. 3=13424
- films, evap., prepn. 3=8926
- films, in vacuo, evaporation fabrication 3=20927
- fracture, single crystals, mechanism 3=23360
- fusion curve at high pressures 3=14417
- gamma-rays, effects, temp., illum. depend., mechanism 3=25312
- gels, Si-base, high-temp. stability 3=21010
- growth, epitaxial, from SiCl₄ 3=20797
- growth, epitaxial, stacking faults 3=805
- Grüneisen γ , temp. depend. calc. 3=10607
- heat treatment, resistivity, changes and other effects survey 3=15579
- impurity diffusion 3=22824
- i.r. absorption spectra of n and p crystals 3=935
- i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
- ion beam from h.f. source 3=24380
- ion bombarded, in glow discharge, P and B diffusion 3=22823
- isotope separation, Si^{28,29,30}, by thermal diffusion of SiH₄, in column 3=25072
- Kapitza resistance meas. 3=12017
- lattice absorption i.r. bands, shell model applic. 3=10927
- lattice absorption of light 3=928
- lattice displacements, proton induced 3=13023
- lattice distortions, frozen and reversible?, in thin plates 3=10653
- lattice thermal conductivity, rel. to impurities 3=10610
- lattice vacancy, e.s.r. study 3=22734
- lattice vibration frequency, 293° and 580°K 3=25181
- lattice vibrations, normal modes, θ -series calc. 3=4809
- layers, vapour grown, etch figures 3=804
- lines in solar u.v. spectrum 3=9200
- liquid, density rel. to temp., and m. pt. 3=3793
- mechanical props. and dislocations, -196 to 1380°C 3=5064
- melt, diffusion of impurities 3=18803
- melt, diffusion of impurities 3=18804-5
- microstrains at B impurities, in dislocation-free crystals 3=15486
- neutron bombardment tracks, obs. by electron microscopy 3=15524
- optical absorption by defect vibrations 3=10581
- optical reflectance for 1.5-25 eV photons 3=8584
- paramagnetic centre due to electron irradi. 3=6750
- phonon absorption bands, rel. to neutron irradiation 3=23044
- photoconductivity, decay, In-doped 3=17833
- photon and electron pair production 3=10101
- piezoresistance, rel. to pressure to 200 kp cm⁻² 3=2065
- piezoresistive pressure transducers 3=887
- piezoresistive props., n- and p-type diffused layers 3=10798
- plate, X-ray transmitted diffraction intensity, rel. to applied stress direction 3=23525
- precipitation of Ni 3=6537
- proton damage, energy depend. calc. 3=8474
- radiation defects, annealing, rel. to P impurity 3=22934
- radiation defect introduction rates in n and p-type 3=6551
- radiation defects, in Li-doped samples, level spectrum of localized centres 3=22849
- ranges of charged particles 3=17113
- recombination radiation, decay, meas. 3=20540
- reflectivity spectra, visible and u.v., fine structure and temperature dep. 3=10909
- refractive index, from reflectivity at two angles, using graphs, extreme u.v. 3=11926
- refractive index meas. in i.r. 3=20433

Silicon—contd

- rod and platelet lattice defects 3=22783
- secondary emission, by K ions 3=16978
- single crystals, structural defects, after electron irradi., photocond. study 3=22764
- solar cells, effect of proton irradi. 100, 500 keV 3=14508
- solubility of impurities, maximum, and m.p. distrib. coeff. 3=20910
- spectra, i.r. absorption of defects, rel. to irradiation 3=23076
- spectrum i.r., broadening, due to B doping, mechanisms 3=23080
- spin—lattice relax., Raman, for shallow donors 3=11119
- spin—spin coupling with protons 3=719
- sputtering, using 1-5 keV Ar⁺ ions 3=9877
- stacking fault energy 3=17764
- stacking-fault structures when epitaxially grown 3=25286
- stacking faults after vapour growth 3=22794
- structure changes at high press. 3=11210
- structure of clean (100) and {111} surfaces 3=13554
- surface damage due to abrasion 3=18219
- surface energy, cleavage meas. 3=25177
- thermal conductivity, 300°-1200°K 3=10611
- thermal conductivity, 300°-1400°K 3=15449
- thermal conductivity, 630-1000°K 3=22671
- thermal expansion anomalous negative low-temp. values 3=10603
- thermal expansion, 23°-530°C, X-ray meas. 3=4824
- thermal oxidation 3=13600
- thin film, absorption and reflectivity, u.v. 3=2995
- twin boundaries 3=11215
- uniaxial strain effects on $J = \frac{1}{2}$ valence-band edge 3=4797
- X-ray diffr. patterns, single-crystal 3=5097
- X-ray spectrum short wave limit 3=4919
- X-ray transmission, impurity effects 3=23098
- O₂ in, diffusion, solubility, light absorpt. and other effects 3=15579
- Si IV spectrum, doublets, fine structure 3=10446
- Si XIII, impurity in deuterium plasma, X-ray spectra 3=7581
- Si, lattice defects, by X-ray diffraction microscopy and double—crystal spectrometer 3=22707
- Si, u.v. reflection spectra, rel. to strong doping 3=18007
- Si, O impurities round dislocations 3=22761

Silicon compounds

See also Quartz.

- chabazites, self and exchange-diffusion of ions 3=6534
- cyclo-silicates, i.r. spectrum band, calc. 3=13171
- glass, borosilicate, granular structure, by electron microscopy 3=13545
- iron group ions in tetrahedral sites, g-factors and field splittings, rel. to elec. fld. 3=23199
- prochlorite (natural silicate), use in X-ray spectrometers and monochromators 3=4230
- silica-alumina, i.r. study of surface 3=11313
- silica gel, films adsorption and catalysis, rel. to irradi. 3=6896
- silica gel, H atoms formed when γ -irradi. 3=3419
- silica gels, microwave and dipolar spectra 3=22984
- silica replica films, structure examin. 3=3375
- silica, vitreous, scattering of light, effect of elastic strains 3=921
- silicate glass, i.r. spectra 4.2° to 773°K 3=3019
- silicate materials, hole formation, near atomic dimensions 3=16468
- silicates, heat of crystallization, from structure analogy 3=18269
- silicates in chondrites 3=9186
- silicates, Si—O, tetrahedral distance 3=25715
- silyl halides, potential constants and thermodynamic props. 3=8280
- spodumene, crystallization, from Raman spectra 3=5086
- stishovite (SiO₂), crystal structure 3=5108
- Fe-Si (4%), domain wall velo., effect of plastic deformation and irradiation 3=11068
- SiBr₄, potential const. calc. 3=17588
- SiC, α -phase, electronic cond. 300°-1500°K 3=6603
- SiC, bond character rel. to A^{III}B^V cpds. and ZnS 3=2688
- SiC, crystal bonds 3=6451
- SiC, elastic constants 3=18160

Silicon compounds—contd

- SiC, electroluminescence in n-type region 3=6684
- SiC, growth, high spiral steps, breakdown 3=20798
- SiC, growth of single crystals by sublimation in Ar 3=5085
- SiC, hexagonal. hole and electron mobility 3=10838
- α -SiC, luminescence, 5450-6700 Å 3=25485
- SiC, n-type, transient recomb. meas. 3=10840
- SiC, p-n junctions, hot electron emission 3=883
- SiC, photocond. and p-n photoeffect 3=13136
- SiC, photocond. relax. and carrier lifetimes 3=15634
- SiC, photoconductivity kinetics 3=8571
- SiC, polytypes, anomalies 3=11212
- SiC, semicond., p-i-n junction, V-I characts., photovoltaic effect, p-n luminescence 3=13082
- SiC single crystal platelets, crossbending strength 3=20708
- SiC, 6H, luminesc. of nitrogen-exciton complexes 3=18034
- SiC, spectra, luminescence 3=20485
- SiC, sputtering by positive ions 3=4214
- SiC, thermometer, resistance, 4-10°K 3=9666
- SiC, u.v. absorpt. spectrum, var. with temp. 3=10990
- Si(CH₃)₄, potential const. calc. 3=17588
- SiCl₄, potential const. calc. 3=17588
- SiCl₄, valence force fields calc. 3=17551
- SiCl₄, vibr. analysis of B—X bands 3=10522
- SiD, vibr.—rotational energy transfer 3=6414
- SiDCl₃, valence force fields calc. 3=17551
- SiD₃NCS, molecular const. 3=22573
- SiF₄, γ -irradiation at low temp. 3=12874
- SiF₄, potential const. calc. 3=17588
- SiF₄, Raman intensities for $\nu_1(a_1)$ modes 3=22559
- SiF₄, thermodynamic props. 3=21636
- Si—Fe crystals, deformation bands, by electron microscopy 3=8912
- Si—Fe, deformed, substructures and recrystallization 3=23468
- Si—Fe films, ferromag. domain structure 3=11076
- Si—Fe, magnetostriction, temp. depend. 3=1151
- Si (3.5%)-Fe, domain structure, 0-600°C, from longitudinal Kerr effect 3=11071
- 3% Si—Fe, domain-wall widths 3=13252
- Si—Ge crystals, vapour growth, epitaxial 3=3281
- SiH derivs., proton and F¹⁹ chem. shifts 3=22603
- SiH₄, potential const. calc. 3=17588
- SiH₄, prepn. for ionization chamber 3=2508
- SiH₄, vibr.—rotational energy transfer 3=6414
- SiHBr, mol., thermodyn. props. 3=12798
- SiHCl₃, mol., thermodyn. props. 3=12798
- SiHCl₃, valence force fields calc. 3=17551
- SiH₃NCS, molecular const. 3=22573
- SiH₃PH₂ and SiH₃AsH₂, proton resonance 3=12863
- SiH₄, potential const. calc. 3=17588
- Si-KOH boundary, photoelectrochemistry 3=6923
- SiN, B² Σ^+ —X² Σ^+ spectrum 3=8269
- Si₃N₄ thin films, dielectric constant 3=8555
- Si—Ni solid solution, Ni solubility, 900° to 1350°C 3=3338
- Si oxide films, thermally oxidized, absorpt. 9 μ , decrease on γ -irradiation 3=13189
- SiO and CeO₂, evaporated, as optical film, protective, for mirrors 3=11927
- SiO and CeO₂, evaporated, for optical films, anti-reflection 3=11928
- SiO evap. films, stress in, effect of exposure to air 3=1365
- SiO films, stress anisotropy rel. to prep. 3=11144
- SiO films, optical props. rel. to evap. rate 3=20486
- SiO, thin films, dielectric constant 3=8555
- SiO, intensity distrib. in forbidden $\pi^* \rightarrow \sigma^*$ transition 3=10523
- SiO, sublimated films, residual stresses 3=11146
- SiO₂, adsorption of benzene 3=1382
- SiO₂, adsorption of hydroxyl groups, spectrum and heat vars. 3=8922
- SiO₂, "Aerosil" silica, adsorption and diffusion of CO₂ 3=18399
- SiO₂ fibres, periodic structure 3=18370
- SiO₂, film growth on Si, in O₂, at 1250°C, mechanism 3=23516
- SiO₂ films on Si, refr. index and thickness 3=13149
- SiO₂ films, passivation of p-n junction particle detectors 3=7749

Silicon compounds—contd

- SiO₂, films, 350–5000 Å, insulation 3=21388
 SiO₂ fused, u.s. wave interaction 3=25191
 SiO₂ glass, elastic moduli and u.s. attenuation, effect of fast-neutron irradiation 3=13330
 SiO₂ glass, specific heat, low-temp. excess 3=767
 (66.7%)SiO₂–Na₂O, ordered rel. to disordered phases 3=11303
 SiO₂, p–i–p junctions, rectification and e.m.f. 3=10849
 SiO₂, surface conductivity, due to adsorbed molecules 3=25318
 SiO₂, thin films, dielectric constant 3=8555
 SiO₂, vitreous, dilatations due to irradiation 3=4899
 (Si₂O₅KAl)₄, orthoclase, i.r. reflection spectrum, 10 to 30 μ 3=18014
 SiO₂·3CaO, polymorphism 3=3301
 SiO₂ + C, electron field emission 3=21851
 SiO₂, Sb diffusion 3=25294

Silver

- Ag⁺, quadrupole antishielding factor 3=12772
 atoms, e.s.r. in paraffins at 77°K 3=15948
 atoms, trapped in H₂O and C₂H₅OH, e.s.r. at 77°K 3=25575
 Bordoni peaks, rel. to deformation and annealing 3=23298
 cold work damage, X-ray study 3=18202
 cold-worked, stored energy release on annealing 3=11173
 creep props. rel. to O content 3=13363
 cross-slip and stacking-fault energy 3=1230
 crystals, hillocks, etch pits, unstable faces, formation conditions 3=17714
 defect clusters, rel. to fission fragment irradiation 3=17803
 desorption energy from Mo and Ni 3=23521
 deuteron scatt., elastic, 11.8 MeV 3=17490
 diffusion and solubility in Bi₂Te₃ 3=12998
 diffusion, anomalous, of Ce, Nd and Pm 3=13005
 diffusion, in Ag, Ni, Au, surface 3=20232
 diffusion in Bi₂Te₃–Bi₂Se₃, and escape, effect of atmosphere 3=20219
 diffusion in Cu bicrystals, grain boundary 3=6533
 diffusion, in liquid Bi, 300–700°C 3=21331
 diffusion in Mg, ion mobility, d.c., and scatt. 3=22831
 diffusion of Fe, Co, Ni, rel. to solubilities 3=13006
 diffusion of Ni and Co 3=22814
 diffusion, self, surface 3=22821
 diffusion, surface, coeffs. meas. 3=17792
 dislocations, etch pits in single crystals 3=806
 elastic constants, –183° to 300°C 3=20688
 elec. cond., change due to torsional deform., law 3=8490
 elec. resistivity, effect of plastic strains 3=13036
 electrical contacts, metal migration 3=9690
 electrolytic deposition for targets and radioactive courses 3=24532
 electron emission, secondary, 20°–450°C 3=427
 electron energy loss by bremsstrahlung at 1 MeV 3=17699
 electron scatt. by films, background intensity 3=4202
 electrotransport mobility of Sn impurities 3=8433
 epitaxial film, similarity with Au, Cu 3=23506
 equation of state from interatomic potential 3=4828
 etching by ion bombardment, electron micr. study 3=18241
 fatigue, slip processes correl. with hardening 3=20748
 fault arrays, produced by AgBr exposure to light 3=20199
 Fermi surface, dimensions 3=6495
 Fermi surface, effect of pressure 3=8398
 filament growth from AgI crystals 3=1268
 film, electron beam energy losses 3=20152
 film, electron diffraction spot pattern intensity meas. 3=1283
 film on Ag, Pd, Ni, structure 3=1371
 films, deposited on water surface 3=25774
 films, defects produced on evaporation 3=1374
 films for multiple-beam interferometry 3=21560
 films, granular, electrical properties and flicker effect 3=15540
 films, Im 1/ε absorpt. spectrum 3=10963
 films, low lying energy loss 3=10633
 films, neutron irradiation effects 3=22869
 films, on silver-coated mica, double-positioning structure 3=1376
 films, sputtering inside electron microscope 3=451

Silver—contd

- films, optical consts. rel. to wavelength 3=10902
 films, optical density meas. 3=20934
 films, plasma resonance absorpt. 3=10634
 films, single-crystal, prep. method 3=1367
 films, structure rel. to speed of formation 3=20923
 films, 35–50 μ, strength, tensile, 100–300°C 3=6783
 films, transverse electric field effects 3=15541
 film, temperature rise, rel. to electron irradiation 3=17807
 Grüneisen γ, temp. depend. calc. 3=10607
 impurity ions in Ag, scattering cross-sections and charges 3=17813
 interstitial configurations, rel. to deuteron-irradiation 3=22755
 ion mobility in Mg, d.c., scatt. 3=22831
 ions, elec. transport in α-quartz 3=10692
 L-absorption spectrum, fine structure, theory 3=6661
 lattice energy, dislocation annealing 3=22779
 layer growth in electron microscope 3=18381
 liquid, structure, by X-ray scatt. 3=9438
 magnetoacoustic effect to 350 Mc/s, Fermi surface dimensions 3=2759
 magnetoplasma resonance, l.f., meas. 3=8409
 mechanical strength, tensile, time var., low temp., anomalous 3=20729
 microscopy, u.v. transmission 3=23523
 multiple glide and orientation changes meas. 3=5068
 nucleation on AgCl 3=16842
 optical constants and electron theory 3=2986
 optical consts., polarimetric method 3=11943
 optical props., effect of vacuum annealing, Ar-ion bombard. 3=20435
 permeability to oxygen 3=13549
 photoelectric emission, by X-rays, 0.28–9 keV, on films, effective depth 3=21864
 photoelectric emission, from thin layers, by γ-rays, ang. distrib. 3=8204
 photoelectric emission, X-rays, 0.7–30 keV 3=14638
 photographic deposit grains, absorpt., light 3=21576
 plastic deform., vacancy supersaturation 3=13356
 platelets growth, electron-transparent 3=3273
 point defects in irradiated metal, review 3=8420
 self-diffusivity in twist boundaries 3=22820
 sound velocity, effect of high mag. field 3=8356
 sputtering by Ar⁺ ions, 10–200 keV 3=7655
 stacking fault energy, from plastic deform. 3=15501
 surface self-diffusion and faceting 3=25292
 thermal conductivity, phonon and electron components separation methods 3=12930
 thermal expansion, 20°–1200°K 3=17663
 thin films, optical constants, rel. to heat treatment 3=13146
 thin foils, electron scatt. intensities 3=1302
 thin layers, photoelectron emission velocity distrib. 3=9835
 u.s. pulse propagation, 62 Mc/s 3=10592
 vacancies, properties 3=22738
 vacancies, quenched-in, interaction with O impurity 3=22747
 wire, optical props. down to 2000 Å diam. 3=13159
 wires, internal friction peaks, at low temps. 3=18166
 X-ray diffrn. examin. of unit cell contraction

Silver compounds

- alloys, dilute, electric field gradients, rel. to valence and size effects 3=22718
 alloys, superconductivity 3=16873
 binary alloys with rare-earth metals, structure 3=18336
 microscopy, u.v. transmission, Ag alloys 3=23523
 Ag-base alloys, stacking faults rel. to solute 3=2811
 Ag halide dispersions, particle size change. 3=25839
 Ag halides, adsorption of water vapour 3=1381
 Ag halides, ionic transport processes 3=13607
 Ag halides, Ni²⁺ absorption spectra 3=6654
 Ag–Al, ordering in hexagonal ζ-phase 3=6862-3
 AgAu, colour change on plastic deformation 3=10962
 Ag–Au solid solutions, self-diffusion meas. 3=6538
 Ag–Au solid solutions, Zener relaxation, rel. to concentration 3=23299
 Ag + Bi alloys, liquid, vapour pressure 3=14422
 AgBr, anti-colour centre, e.s.r. absorption 3=6542
 AgBr, defect electron transport number 3=6487
 AgBr, Hall mobility of holes 3=13080
 AgBr, magnetoconductivity theory 3=15464

Silver compounds — contd

- AgBr, magnetoresist. and cond. band structure 3=8529
 AgBr, photoconductivity 3=6636
 AgBr, photoconductivity and photo-e.m.f. 3=2969
 AgBr, polaron mass, polaron theory of electron mobility rel. to expt. 3=2768
 AgBr precipitates, adsorption of H^+ and OH^- ions 3=5165
 AgBr, print-out effect, defect electron behaviour 3=3406
 AgBr, reaction with Br_2 , study using defect electron cond. 3=6912
 AgBr—AgCl mixed crystals, absorption tail 3=3020
 AgBr, CdS-doped, optical props. 3=18006
 AgBr:Ni, bleaching processes 3=13187
 AgBr, Ni-doped, dielectric loss-factor meas. 20°–200° K 3=8554
 AgBr, Ni^{2+} paramag. reson. and relax., liquid H temps. 3=13307
 AgBr, photographic emulsion, radiation response, ionizing 3=14390
 AgBr sols, Tyndall spectra, higher order 3=13629
 AgCd alloy, crystal structure 3=13501
 Ag—Cd, ϵ and η phases, lattice spacings 3=6856
 Ag—Cd, four phases, thermodyn. props. 3=13522
 Ag—Cd, lattice spacings 3=3313
 AgCd, order—disorder transformations 3=3328
 AgCl crystals, for particle track visualization 3=5906
 AgCl crystals, particle tracks inside 3=7754
 AgCl crystals, u.v. absorpt. 3=929
 AgCl, Dember effect in u.v., rel. to temp. 3=2948
 AgCl, dislocation—impurity interactions and strain aging 3=17718
 AgCl, electron drift mobility, 70–350°K 3=6486
 AgCl, electron mobility in high elec. fields 3=8387
 AgCl, electron trapping centres, nature 3=20521
 AgCl, Frenkel defects and thermal expansion 3=10604
 AgCl, heat of solution in molten KNO_3 3=14153
 AgCl, luminescence, blue-green band, Stark effect 3=18031
 AgCl, luminescence growth kinetics meas. 3=18033
 AgCl, luminescence, rel. to divalent anion and cation dopants 3=23106
 AgCl, luminescence when pure and doped 3=25486
 AgCl, luminescence, X and β induced 3=6671
 AgCl, magnetoconductivity theory 3=15464
 AgCl, photoconductivity and photo-e.m.f. 3=2969
 AgCl, photoelectret state and energy levels 3=2964
 AgCl, photoelectret state formation 3=15623
 AgCl, point defects 3=12966
 AgCl, polaron mass, polaron theory of electron mobility rel. to expt. 3=2768
 AgCl, polygonization 3=15502
 AgCl, precipitation kinetics meas. 3=18270
 AgCl, reaction with Cl_2 , study using defect electron cond. 3=6912
 AgCl, trapping level spectrum, thermal effects 3=8397
 AgCl, u.v. refl. spectrum at 20° K 3=4959
 AgCl, vacuum outgassing props. 3=18870
 AgCl, Co^{2+} and Ni^{2+} impurities, props. 3=15487-8
 AgCl, Cu-doped, rate of volume photolysis 3=11358
 AgCl : Mn, luminescence of red Mn bands 3=20522
 AgCl, Ni^{2+} paramag. reson. and relax., liquid H temps. 3=13307
 AgCl:Ti, luminescence temp. depend. 3=18032
 $Ag_2C_2N_2O_4$, crystal structure 3=13478
 AgF, spectrum, near u.v. 3=12832
 Ag—In—Cd control rod in pressurized water reactors 3=6336
 AgI, aerosols, phase changes 3=1402
 AgI, approach to metallic state 3=17812
 AgI, exciton, absorpt. and refl. spectra 3=4975
 AgI, hexagonal, crystal structure 3=5102
 AgI, hexagonal, structure 3=18310
 AgI—KI— H_2O , water adsorption 3=23522
 AgI, photoconductivity and photo-e.m.f. 3=2969
 AgI soln. system, electrical double layer, ionic charge components, calc. 3=18454
 AgInSe₂, semiconductor, prep. and props. 3=864
 AgInTe₂, semiconductor, prep. and props. 3=864
 AgInTe₂, solid solns. with HgTe and CdTe, elec. props. 3=876
 Ag—Li, stacking faults 3=15499

Silver compounds — contd

- Ag—Mn alloys, paramag. susceptibility 3=8643
 Ag—Mn, ferromag.—antiferromag. model 3=20585
 AgN₃, unit cell dimensions 3=11265
 AgNO₃, fused, thermoelectric power 3=9477
 AgNO₃, m.p. and volume of fusion, press. depend. up to 10⁴ atm 3=24110
 AgNO₃, structure change, kinetics of phase growth 3=13401
 Ag—Ni alloys, Fick's first diffusion eqn. 3=15503
 Ag₂O, ads. of cations, anions, in dilute solns. 3=13608
 Ag₂O, 2°–80°K, specific heat and entropy 3=769
 Ag₂O, specific heat of large crystals 3=768
 Ag—Sb—Te, AgSbTe₂, phase formation 3=18345
 AgSbTe₂, Hall effect, anomalous 3=836
 Ag—Se films, structure 3=13563
 Ag₂Se, thermal and elec. props. 3=2926
 AgSbTe₂, resistivity and thermoelectric power, 80° to 300°K 3=13144
 AgSbTe₂, solid solns. with PbTe and SnTe, elec. props. 3=876
 AgSbTe₂—AgBiTe₂, —PbTe, and —SnTe, thermoelec. props. 3=10900
 AgSbTe₂, Se₂, thermal, elec. props. 3=875
 AgSe, molecular spectrum, absorption 3=10524
 Ag—Sn—Mn alloys, paramag. susceptibility 3=8643
 Ag—10% Sn, f.c.c., filings, heavy deform. faulting, by X-ray diffr. 3=8418
 Ag—Te films, electron diffraction study 3=18383
 AgTe, molecular spectrum, absorption 3=10524
 β -Ag₂Te, elec. & thermal props. 3=837
 Ag₂Te films, elec. props., structure 3=833
 Ag₂Te films, structure transformation 3=18384
 Ag₂Te, semiconducting properties, +20° to -190°C 3=20343
 Ag₂Te—Sb₂Te₃, phase diagram 3=836
 AgTiTe, semiconductor, prep. and props. 3=874
 Ag—Zn alloy, packing defects, 600°–650°C 3=20160
 Ag—Zn alloys, transport numbers, various phases 3=11354
 Ag—Zn alloys, transport of Ag, Zn, under elec. field 3=20235
 Ag—Zn, deformation in tension and shear 3=15986
 Ag—Zn, ϵ and η phases, lattice spacings 3=6856
 AgZn, Hall effect 3=838
 AgZn, three structural phases, thermodynamics 3=1352
 Ag—Zn, ζ -phase stability 3=8396
- Sintering**
 thermoelectric materials, powder metallurgy 3=3346
 Al, rel. to pressure, time, temp. 3=6876
 Ba ferrite, rel. to coercivity 3=11094
 BeO 3=18368
 Bi₂Te₃, cold compacting 3=3346
 CdS films, rel. to photocond. sensitivity 3=904
 Cu, void shrinkage and densification 3=13537
 Fe powder, rel. to grain boundary sliding 3=11293
 Mo, grain size reduction on adding Si 3=20921
 NaCl, evaporated films, mechanism 3=25777
 NiZnCo ferrite, rel. to magnetic dispersion 3=18100
 Pt—Al₂O₃, catalyst, 300° to 1300°C 3=18387
 UC, conditions 3=7079
 UO₂, in H, pore distrib. 3=11311
 UO₂, microfractographic obs. 3=3240
 UO₂, sintered, high-temp. torsion 3=6777
 W rods, in H₂ atmosphere 3=13541
 WO bronzes, temperature 3=25390
- Skin effect**
 anomalous skin effect and n.m.r. in metals 3=20673
 anomalous, theory of 3=19253
 electron surface collisions, Fermi liq. theory 3=25245
 exploding wire circuits, transient effects 3=3981
 ferromagnetic resonance, role in 3=23207
 metals, anomalous, magnetoplasma oscill. 3=8411
 metals, electron momentum meas. 3=6496
 metals, surface impedance in i.r. region 3=20434
 m.h.d. travelling-wave devices 3=21967
 normal, in mag. fld. at low temp. 3=2778
 size effect, 1–5 Mc/s 3=842
 size effect, 1–5 Mc/s 3=8493
 static skin effect, in strong mag. field 3=25223
 Cr, polycryst., meas. rel. to Fermi surface area 3=2757

Skin effect — contd

- Mo, polycryst., meas. rel. to Fermi surface area 3=2757
 W, polycryst., meas. rel. to Fermi surface area 3=2757

Sky brightness

- See also Airglow; Twilight.
 albedo, rel. to atmospheric turbidity 3=6961
 altitude depend. and absolute brightness 3=23626
 daylight, spectral energy distrib. 3=11406
 i.r. radiation distrib., prediction 3=3465
 night, separation of extra-terrestrial and atmospheric components 3=16279
 night sky at 8640 Å up to 200 km 3=23627
 polarization, calc., different model atmospheres 3=1445
 polarization meas. of skylight 3=19028
 scattered, 1-3.5 μ , up to 17 km 3=18510
 total radiation meas. during IGY 3=8042
 twilight, effect of lunar atmosph. tide 3=6988

Sliderules

- dB addition, circular 3=11672
 for complex numbers 3=5323
 ionospheric absorption loss and max. usable frequ. 3=24483

Slip

- bands, energy release during fracture 3=1242
 and climb forces 3=17726
 crystals, independent systems, number 3=16000
 elastic domain development 3=13367
 f.c.c. crystals, primary systems, dislocs. 3=12975
 fatigue crack nucleation, cross-slip models 3=20749
 fatigue damage accumulation at high temp. 3=20745
 friction acting on moving dislocation 3=17728
 glide, secondary, shear stress formula 3=5069
 ice, glide bands, non-basal, on plastic deformation 3=17763
 metals, discontinuous slip, low-temp., apparatus 3=9667
 metals, fatigue, microstructural damage 3=20735
 multiple glide and orientation changes meas. 3=5068
 surface replicas, calc. of work hardening rate 3=20720
 Ag, fatigued, correl. with work hardening 3=20748
 Ag, rel. to stacking-fault energy 3=1230
 Al alloys, fatigued, microstruct. changes 3=20741
 Al, rel. to fission fragment bombardment 3=17706
 Al, rel. to stacking-fault energy 3=1230
 Al, secondary glide near grain boundaries 3=5069
 Al, slip line behaviour under stress reversal 3=8441
 Al, 350-400°C, electron microscopy obs. 3=22793
 Bi, polycryst., under pressures to 20,000 atm. 3=16017
 Cu, persistent slip bands near grain, twin boundaries 3=2809
 Cu polycrystals, surface obs, after deform. 3=18199
 Cu, rel. to irradi.-produced prismatic dislocations 3=17760
 Cu, rel. to stacking-fault energy 3=1230
 Cu, torsional fatigue cycling 3=20747
 α Cu—Al alloy, primary and cross-slip lines 3=15999
 Cu—14% at Al single crystals, cross, during easy glide, no temp. var. 3=23337
 α Cu—Al single crystals, microstraining 3=20706
 Cu—Au alloys, rel. to ordering 3=20685
 Cu—Zn alloys, rel. to stacking-fault energy 3=1230
 Fe, α - phase, slip bands after neutron irradi. 3=809
 Fe crystals in tension 3=20198
 α -Fe, deform. twins, indented surface markings 3=13403
 Fe, zone-melted, unusual 3=10678
 Fe—3%Si, plastic deformation 3=20176
 Ge, single without cracks, etching obs. 3=22792
 MgO, motion of dislocations 3=5071
 MgO, rel. to fracture 3=6802
 NaCl, usual and transverse, rel. to load 3=17758
 Ni, part of creep not revealed structurally 3=18194
 Pb, polycrystalline, under simple shear 3=6793
 PbS, slip-line and etch-pit analysis of glide 3=25266
 Sn films 3=17736
 β -Sn, slip- and twin dislocations 3=25658
 TiO₂, plastic deformation 3=23328
 α -U, deformed, mechanism 3=13370
 UO₂ 3=17733
 W, on {112} planes, at 1250°K 3=13366
 Zn, fatigued, correl. with work hardening 3=20748
 Zn, intergranular in bi-crystals, by interferometry 3=6528
 Zn, pyramid, dislocation reactions 3=2797

Smokes

See Aerosols.

Snow

- cloud formation, freezing of droplets, review 3=1439
 clouds, cirrus, crystals 3=18504
 crystals, twelve branched 3=16024
 electrical conductivity d.c., -50 to -8°C 3=6612
 fallout, altitude distrib. 3=8053
 heat transfer by vapour diffusion 3=11979
 radiation reflection, angular dependence 3=11383
 transmission of visible radiation 3=13650
 viscosity, meas. 3=3440
 wind meas. using radar Doppler shift 3=1433

Sodium

- annealing 5°K 3=8445
 arc jet, direct current, 4982.8 Å line broadening 3=9757
 atom, collision with diatomic mol., electronic—vibr. energy transfer 3=6433
 atom, optical excitation function meas. 3=10469
 atom, spectral line blackening in hollow cathode 3=19936
 atom, $3^2P_{3/2}$ state, mean lifetime meas. 3=15287
 atoms, electron scatt., 1-10 eV, total cross-section 3=2582
 band structure, composite wave variational method 3=25237
 cations, determination in atmosphere 3=1408
 chemical reaction, with halomethanes, activation energy and number of CH and CF bonds 3=18440
 conduction electron paramag. susceptibility 3=1053
 diamagnetism, p—s—p band model 3=8638
 diffusion, in LiF, along dislocation pipes 3=10687
 elec. resist, effect of pressure at low temps. 3=828
 electron density ratio in metallic and free atoms 3=15947
 electron mass shift calc. 3=10588
 exchange energy of electron gas 3=15474
 films, electrical conductivity, rel. to temp. and thickness 3=15550
 gas, density, interferometric meas., by amplitude, Fabry—Perot etalon 3=21564
 Hall effect, high-field, at 4°K 3=840
 ions, energy loss processes in rare gases 3=19186
 ions, Na⁺, diffusion in glass, 400-500°C 3=22936
 ions, Na⁺, range in Al 3=12608
 lattice dynamics, dispersion curves at 90°K 3=2709
 lattice vibs., frequency distrib. 3=15422
 liquid, dynamics, vibrational modes, by neutron scatt. 3=1675
 liquid, f-sum rule, violation, by slow neutron scattering 3=5429
 liquid, free-electron model of elec. cond. 3=23903
 liquid, friction between clean metals in 3=1249
 liquid, ions, long-range osc. interactions 3=9439
 liquid, in metallic tubes, heat transfer 3=3909
 magnetoplasma resonance, satellites 3=25259
 mechanical props., low-temp. polymorphism 3=3224
 molecules, spectrum, u.v., and electronic structure 3=22549
 molten, elec. resist. and Hall effect 3=9475
 molten, heat transfer in staggered tube bank cross-flow 3=16816
 moving edge dislocations 3=10654
 n.m.r. in rochelle salt, quadrupole shifts, second order 3=25594
 nightglow emission, correlation with OH 3=3511
 nuclear acoustic resonance absorption 3=20088
 orthogonalized plane wave form factors 3=25229
 paramagnetic susceptibility meas. 3=11031
 plasma, production 3=392
 resistivity, elec., effect of capillary constraints 3=7410
 self-pinch instabilities 3=16950
 specific heat calc. 3=6476
 specific heat calc. by Toya's method 3=10599
 spectrum of D-lines in twilight glow 3=9099
 transport, in arcs, electric, compared with Cu 3=24256
 vacuum deposition 3=11844
 vapour, optically pumped, electron scatt. 3=12771
 vapour pressure, correlation 3=14423
 vapour, thermodynamic props., calc., criticism 3=21444
 X-ray emission spectra, plasmon satellites 3=8607

Sodium — contd

- X-ray emission spectrum, valence band 3=8606
- NH₃ soln., e.s.r., effect of adding NaI 3=11811
- Na—NH₃ solns., proton resonance 3=7222
- Na—Mg vapour mixture, fluorescence 3=705
- Na/Sn liquid-metal cell 3=1926
- Na X, impurity in deuterium plasma, X-ray spectra 3=7581
- in Sn, effect on structure and microhardness 3=3334
- in Sn recrystallized surface, effect on microhardness and structure 3=20760

Sodium compounds

- alloys, superconductivity 3=16873
- benzo-acetate, luminescence, temp. var. and dosimetry 3=17117
- borate glass, structure of solid and liquid 3=1361
- borate, glass, u.v. absorpt., composition and temp. effects 3=13173
- borates, i.r. spectra 3=13174
- brine, inclusions in ice, migrations under temp. gradients 3=8789
- cryolite (AlF₃·3NaF), films, structure from optical consts., adsorption formation theory 3=13560
- feldspars, Na²³ and Al²⁷ n.m.r. 3=23263
- fluoride, liquid, adiabatic compressibility, from u.s. vel. 3=5440
- halides, prismatic dislocations during photolysis 3=2798
- hydrosodalite, unit cell and space group 3=23461
- Rochelle salt, electrostriction 3=13121
- Rochelle scatt., ferroelec., electrocaloric effect 3=25403
- rock salt, dielec. breakdown temp. 3=25408
- rocksalt, elec. strength anisotropy 3=6621
- rocksalt, electric charge flow during deformation 3=8767
- rock salt, optical density spectral distrib., rel. to plastic deformation 3=17988
- salicylate, luminescence, temp. var. and dosimetry 3=17117
- silicate, glass, u.v. absorpt., composition and temp. effects 3=13173
- structure change to CsCl-type at 18 000 kg/cm² 3=6811
- Na—aromatic complex, e.s.r. hyperfine splitting 3=25138
- Na fluorescein aq., luminesc., KI quenching 3=3807
- Na formate, acetate and propionate, u.s. props. 3=14162
- Na halides, mag. screening of Na²³ 3=23272
- Na halides, mixed, Na²³ n.m. relax. 3=8738
- Na halides, sp. ht. rel. to spectroscopic behaviour 3=764
- Na tetraborate hydrates, n.m.r. study 3=8739
- NaAlF₆, i.r. absorption spectrum of vapour 3=22553
- Na₃AlF₆, fused, refractive index rel. to temperature 3=11796
- NaAlSi₃O₈, albite melting curves rel. to pressure 3=9657
- NaBO₂, vaporization, mass-spectrometric study 3=25807
- Na₂[B₄O₅(OH)₄]·8H₂O, proton cond. 3=2904
- Na₂B₂O₇·10H₂O and 5H₂O, Na²³ n.m.r. 3=25591
- NaBePO₄, beryllonite, crystal structure 3=13472
- (Na_{0.5}Bi_{0.5})TiO₃, lattice parameters 3=20851
- NaBr, adsorption of Kr, statist. mech. study 3=3367
- NaBr, fused, refractive index rel. to temperature 3=11796
- NaBr, n.m.r. of Br^{79,81}, Na²³ 3=14185
- NaBr·2H₂O, crystal and proton structure 3=6851-2
- NaBrO₃, optical const., n(λ), k(λ), i.r., from reflection spectra 3=20438
- NaBrO₃, thermal decomposition 3=6910-11
- Na₂CO₃, photo- and thermo-electron emission 3=19306
- Na₂CO₃, thermodyn. props. at high temps. 3=22663
- Na₂CO₃·NaHCO₃·2H₂O, n.m.r. rel. to proton positions 3=8859
- Na₂CO₃·10H₂O, Na₂CO₃·7H₂O, crystal structure, atomic 3=20854
- NaCl aerosol, spherical particles 3=13626
- NaCl aerosols, prodn., props. 3=8983
- NaCl, α and β absorpt. bands in vacuum u.v. 3=8590
- NaCl, α-centres, fluorescence 3=17796
- NaCl and NaCl·MnCl₂, diffusion of Mn 3=6535
- NaCl, aqueous, conductivity, electrical, 300-383° 3=18449
- NaCl, Born repulsive energy 3=2690
- NaCl, Ca, Cd, Co doped, F and Z bands 3=13612
- NaCl, cation vacancy migration, activation energy 3=12962
- NaCl, CdCl₂-doped, strain ageing 3=16002
- NaCl, charged dislocation behaviour 3=8435

Sodium compounds—contd

- NaCl, charged dislocations, sign of 3=25278
- NaCl, charged dislocations, yield stress minimum 3=798
- NaCl, charged dislocs., surface detection 3=22776
- NaCl, charging by rubbing with Ta wire 3=2966
- NaCl, cleaved, evaporation decoration by Ni, Permalloy films 3=20931
- NaCl, CoCl₂ precipitation, Mössbauer study 3=22630
- NaCl, colour centres due to electron pulses 3=8460
- NaCl, colour centres, X-ray prod. 3=25297
- NaCl, conductivity, thermal effects of Li⁺, I⁻, Rb⁺, Ag⁺, Br⁻, K⁺ impurities 3=22644
- NaCl, conductivity, thermal, with CaCl₂ impurity, temp. var. 3=20120
- NaCl, crystal phonon scatt., with CaCl₂ impurity 3=20120
- NaCl, crystal phonon scatt. by Li⁺, I⁻, Rb⁺, Ag⁺, Br⁻, K⁺ impurities 3=22644
- NaCl, crystal structure, amplitudes, high (sin θ)/λ 3=13454
- NaCl crystal whiskers, dislocations, by X-ray diffr. 3=17748
- NaCl, crystallization, holes and mosaic structure 3=1263
- NaCl, crystallization "Morphodrome" from phase diagram 3=16042
- NaCl crystals, neutron diffraction spin-orbit interaction 3=18294
- NaCl crystals, u.v. absorpt. 3=929
- NaCl crystals, X-ray, photoconductivity 3=4955
- NaCl, Cu diffusion, effect of dislocations 3=15513
- NaCl, damage by sliding and wear 3=11189
- NaCl, decomposition by electron irradi. 3=17809
- NaCl, dielec. losses, effect of CO₃²⁻ and OH⁻ groups 3=20375
- NaCl, dielec. props. and thermolum. after X-irrad. 3=8479
- NaCl, dielectric const., 8 mm, by shorted-line wave-guide 3=22973
- NaCl, diffraction of 8-45 Mc/s ultrasound 3=12918
- NaCl, dislocation damping 3=17762
- NaCl, dislocation motion study 3=17759
- NaCl, dislocations 3=17757
- NaCl, dislocations, deformed by concentrated load 3=20183
- NaCl, dislocations, etching technique 3=1258
- NaCl, dislocations, linear cpds. with Cu²⁺ ions 3=25280
- NaCl, dislocations, meas. using u.s. 3=15491
- NaCl, elec. cond. of deformed crystals 3=890
- NaCl, elec. potential due to plastic deformation 3=900
- NaCl, electrical conductivity, rel. to anion impurities 3=17944
- NaCl, enthalpy 3=25198
- NaCl, eqn. of state, Grüneisen const. 3=25205
- NaCl, eqns. of state, rel. to compression data 3=22670
- NaCl, equation of state 3=15447
- NaCl, equation of state, Grüneisen approx., temp. var., calc. 3=20115
- NaCl, evaporated films, sintering, mechanism 3=25777
- NaCl, with excess electron, wave-function and energy 3=22679
- NaCl, exoelectron emission spectrum 3=14618
- NaCl, F-centre formation by X-rays 3=13011
- NaCl, F-centres, origin by X-irrad. 3=15518
- NaCl, F-centres after X-irrad., stored energy 3=2839
- NaCl, F colour centres, X-ray formation 3=22844
- NaCl, Fe²⁺ vacancy-impurity association 3=22631
- NaCl films, electron diffraction intensities rel. to tilting and λH 3=1295
- NaCl, films, orientation, var. with vapour stream angle, by electron diffr. 3=13561
- NaCl films, rapidly condensed, orientation 3=8799
- NaCl, frequency distribution and specific heat 3=25188
- NaCl, fused, refractive index rel. to temperature 3=11796
- NaCl, fused, thermoelectric power 3=9477
- NaCl, Grüneisen constant at high pressures 3=4827
- NaCl, high-press. transf. to cubic CsCl structure 3=16015
- NaCl, high temp. elec. breakdown 3=13123
- NaCl, inclusion of Cu atoms 3=10651
- NaCl, ionic conductivity and time-dependent polarization 3=10872
- NaCl, K-absorpt. spectrum of Cl 3=6660
- NaCl, lattice distortion rel. to impurities 3=15484
- NaCl lattice, OH⁻ ion introduction 3=8432

Sodium compounds — contd

- NaCl local distortions by impurity ions 3=17713
 NaCl, luminescence, whiskers 3=20518
 NaCl, mosaic block structure during creep 3=20209
 NaCl, Na nuc. mag. relaxation, rel. to divalent impurity ions 3=23273
 NaCl, Na²³ n.m.r. in r.f. field 3=3188
 NaCl, Na₂CO₃ and NaOH doped, i.r. absorpt., reflection 3=20489
 NaCl, with Ni impurity, light scatt. 3=20451
 NaCl, phonon scatt. by impurity ions 3=6473
 NaCl, phonon scattering, by dislocations 3=22646
 NaCl, phonon scattering by impurities, n.m.r. study 3=10584
 NaCl, photoconducting, polarization and elec.-field distrib. 3=10869
 NaCl, pipe diffusion in LiF 3=2827
 NaCl, plastic deformation, elec. charge generation 3=23320
 NaCl, pores, neighbouring, approach kinetics 3=25767
 NaCl, as pressure-transmitting medium 3=5308
 NaCl, quantum-mech. box model 3=4796
 NaCl, reactor irradi., internal energy increase 3=13017
 NaCl, recombination luminescence 3=3034
 NaCl, secondary electron emission region, thickness and efficiency 3=19323
 NaCl, secondary emission, by K ions 3=16978
 NaCl, selective etching 3=13408
 NaCl, selective etching, kinetics meas. 3=13409
 NaCl, shear and dislocation structure 3=17758
 NaCl single crystals, ductility, effect of atmospheric reaction 3=13355
 NaCl, single crystals, pure elastic modes, attenuation 3=17656
 NaCl, spectrum, absorption, u.v., β -band maxima calc. and F' centres 3=20487
 NaCl, surface cond., rel. to water vapour pressure 3=22985
 NaCl, surface defects by elec. discharge 3=13558
 NaCl, surface defects, high temp. processes 3=20214
 NaCl, surface features, Czochralski growth method 3=11218
 NaCl, surface treatment, disloc. processes 3=8785
 NaCl, tensile strength of whiskers, meas. 3=25640
 NaCl, thermal etching 3=23387
 NaCl, thermal resistance, fall nr. Debye temp. 3=17670
 NaCl, thermoelec. power 3=13143
 NaCl, thermoluminescence after γ -irrad. 3=11017
 NaCl thermoluminescence, rel. to surf. area and gas press. 3=18052
 NaCl, transient luminescence from plastic deform. 3=4983
 NaCl-type crystals, elastic constants, third order, temp. depend., calc. 3=18164
 NaCl, u.s. internal conical refraction 3=21500
 NaCl, U₂-centre, e.s.r. and photochem. 3=10696
 NaCl, use as standard for thermal cond. meas. 3=5548
 NaCl, vacancies, due to fast neutrons 3=8427
 NaCl whiskers, growth and mechanical properties 3=20804
 NaCl, whiskers, twist det. by electron diff. 3=3275
 NaCl, X-ray coloured, luminescence, u.v. absorpt. 3=813
 NaCl, X-ray line broadening, and strain 3=8934
 NaCl:Ag, absorption, spectrum, fine structure 3=23078
 NaCl—BaCl system, disloc. loops 3=17720
 NaCl—CaCl₂ solid soln., pptn. from 3=20840
 NaCl : Co and : Cd, luminescence 3=4985
 NaCl:Cu, optical props. and electron emission 3=18008
 NaCl-KCl mix crystals, dislocations, on decomposition, obs. by etching 3=12985
 NaCl—NaBr alloys, ductility and microhardness 3=15993
 NaCl : Ni, Ca, luminescence, rel. to dislocations 3=20517
 NaCl:Pb, activator absorpt. spectrum 3=940
 NaCl:Tl and NaCl:Ag, luminescence rel. to impurities 3=18022
 NaClO₂·5H₂O, crystal structure 3=3300
 NaClO₂, crystal growth, speed 3=1262
 NaClO₂, optical const., $n(\lambda)$, $k(\lambda)$, i.r., from reflection spectra 3=20438
 NaClO₂, scattering light, 100°–170°C 3=10921
 NaClO₂, X-ray K-absorpt. spectra of Cl 3=23090
 NaClO₂·H₂O, X-ray K-absorpt. spectra of Cl 3=20498
 Na₂Cr₂O₇, electronic absorpt. spectrum 3=15671
 Na₂CrO₄ solution, magnetic susceptibility 3=143

Sodium compounds — contd

- NaF, α and β absorpt. bands in vacuum u.v. 3=8590
 NaF, distrib. of OH⁻ ions, meas. 3=18223
 NaF, elastic constants, rel. to temperature 3=18163
 NaF, F-centre structure 3=20241
 NaF films, electron diff. study 3=25680
 NaF, fused, refractive index rel. to temperature 3=11796
 NaF, i.r. spectra, by matrix isolation 3=22544
 NaF with impurity valence changes, e.s.r. 3=1180
 NaF, M-centre, paramagnetism question 3=819
 NaF, secondary emission, by K ions 3=16978
 NaF, spin-lattice relax., temp. depend. 3=11118
 NaF—U, luminescence, combined magneto-electric dipole transitions 3=20516
 NaF₂, U-activated, luminescence; "relaxation spectra" 3=3035
 NaFe fluoride, ferrimag. props 3=25547
 NaH, e.s.r. 1.2°K, 9200 Mc/s, and electron density 3=15947
 [Na₂H(PO₃)₃]_n, crystal structure 3=1337
 Na₂H₄[Mn^{IV}(IO₆)₃]₂·17H₂O, crystal structure, atomic 3=23460
 NaI, aerosols, phase changes 3=1402
 NaI, lattice dynamics, dispersion curves 3=20074
 NaI, Raman spectrum, 2537A meas. 3=25465
 NaI, spin-lattice relax., temp. depend. 3=11118
 NaI, thermal resistance, rise nr. Debye temp. 3=17670
 NaI : Tl, absorption spectra, Tl conc. and temp. depend. 3=20490
 NaI:Tl crystal, large, response to β -rays, 55–83 MeV 3=14965
 NaI:Tl crystals, γ -ray attenuation coeffs. 3=14823
 NaI : Tl, γ -ray photoeffects, intrinsic efficiencies 3=19605
 NaI:Tl, i.r. absorption, γ -irrad. effects 3=25449
 NaI:Tl, luminescence, decay time meas. 3=10005
 NaI : Tl, luminescence, X-ray excitation 3=20519
 NaI:Tl, luminescence, X-ray excitation, temp. and Tl conc. depend. 3=23107
 NaI : Tl, photoluminescence excitation spectra 3=20520
 NaI:Tl scintillator, response function to γ -rays 3=3045
 NaI:Tl, X-ray and γ -ray fluorescence 3=13215
 NaI₂H₂O, I¹²⁹ Mössbauer effect 3=2367
 Na—K alloys, liquid, thermoelectric power 3=145
 (Na₁K)₁NbO₄ ceramics, spontaneous polarization 3=892
 (Na₂K)Sb, (Na₂K)CsSb, film, photoelectric emission, effect of n-irradiation 3=14632
 Na₂Mo₂O₇, i.r. absorpt., anion structure 3=4974
 NaN₃ crystals, thermal decomposition 3=13593
 NaN₃, deformed, stacking faults 3=8443
 NaN₃, X-irrad., e.s.r. of N atoms 3=25574
 NaNO₂, ferroelec. phase transition, X-ray study 3=25405
 NaNO₂, ferroelec., twin structure 3=25657
 NaNO₂, fused, transport numbers 3=16172
 NaNO₂, Na²³ nuclear quad. coupling consts. 3=2696
 NaNO₂, phase transformation, X-ray and neutron study 3=1336
 NaNO₂, phase transition, X-ray study 3=13397
 NaNO₂, single crystals, dielectric properties 3=23002
 NaNO₂ single crystals, piezoelec. props. 3=10885
 NaNO₂, fused, refractive index rel. to temperature 3=11796
 NaNO₂, fused splitting of Raman frequencies 3=4761
 NaNO₂, fused, transport numbers 3=16172
 NaNO₂, heat of fusion, entropy 3=21617
 NaNbO₃, field-induced ferroelec. phase, crystal structure 3=8853
 NaNbO₃—KNbO₃, crystal structure 3=8853
 Na(Nb_{1-x}Ta_x)O₃, phase relations 3=13394
 Na₂O, effect on elec. cond. of glasses containing Fe 3=22936
 Na₂O—Al₂O₃—SiO₂ glass, electrodes cation sensitivity and durability meas. 3=3401
 Na₂O—B₂O₃—SiO₂ glass, electrodes cation sensitivity and durability meas. 3=3401
 Na₂C₂B₂O₅·SiO₂, ionizing radiation effects 3=17795
 NaOH and monohydrate, thermodyn. props. 3=7388
 NaOH aq., solubility rel. to freezing point 3=7387
 NaOH solution, interface with Ge; conductance 3=10781
 (NaPO₃)_x, Maddrell's salt crystal structure 3=16079
 Na_{1.5}Pb₄, Pb²⁰⁷ and Na²³ n.m.r. 3=20676
 Na₂S₂O₃, γ -irrad., e.s.r., dehydration effect 3=23236

Sodium compounds—contd

- Na₂SO₃·10H₂O, Na₂SO₃·7H₂O, crystal structure, atomic 3=20854
- Na₂SO₄, fused, refractive index rel. to temperature 3=11796
- Na₂SO₄—H₂SO₄—H₂O, isothermal diffusion 3=1680
- Na₂S₂O₈·2H₂O, crystal structure 3=8848
- NaTaO₃, internal electric fields 3=12903
- NaTaO₃, phase transformations, 22°–680°C 3=23377
- NaTeO₄, high-temp. heat content 3=770
- NaTi, n.m.r., rel. to crystal structure 3=11122
- Na₄V₂O₇, i.r. absorpt., anion structure 3=4974
- Na₂WO₄, fused, refractive index rel. to temperature 3=11796
- Na₂WO₄, i.r. absorpt., anion structure 3=4974
- NaYF₄, crystal structure, atomic, and transformation, 670°C 3=23455
- Na₂Zr₂F₁₃, crystal structure 3=18315
- Na₄Zr₂[Si₈O₂₂], vlasovite, crystal structure 3=13474

Soil

- deformation by beam resting on it 3=5144
- wet ground, freezing, classical Stefan problem, numerical integration 3=24111

Solar system

- See also Planets, etc.
- early history, rel. to rare-earth isotope abundances in meteorites 3=13875
- formation chronology 3=9165-6
- formation, rel. to early history of sun 3=13880
- mass distribution 3=3543
- motion through interstellar space rel. to periodic physico-chemical effects 3=5338
- origin, conference, New York (1962) 3=23668
- origin, from heavy oscillating magnetic star and nearby approach 3=18596
- origin of satellites and planets 3=3544
- planetary, general perturbations, in rectangular coordinates 3=23669
- structural similarity to Galaxy 3=11509

Solid solutions

- See also Alloys; Phase equilibrium.
- alkali halides, heat of formation, NaCl type 3=13390
- binary metal solns., free surface energy, statistical electron theory 3=23485
- with cavities, acoustic dispersion and elastic-wave attenuation 3=2727
- conference, Orsay (1962) 3=6873
- disordered, impurity bands, energy spectrum structure 3=25242
- dynamic and static distortion 3=10574
- f.c.c., stacking faults, segregation of solute atoms 3=8442
- γ-ray absorpt., emission, by impurity nuclei 3=8337
- Group III–V semiconductor, with Group IV substituents defect equilibria 3=22758
- Guinier–Preston zones, spatial distrib. 3=8878
- ilmenite–haematite system, low temp., superparamagnetism 3=8655
- impurity diffusion, thermodynamic theory 3=22803
- interstitial, binary, single-phase, dislocation theory 3=20177
- interstitial, thermodynamic equilib., appl. of Green's functions 3=18362
- interstitials, equil. distrib., crystal symm. 3=25271
- metallic, local order, mean vibr. state of atoms 3=8347
- metals, diffusion, crystal vacancy and interstitials, calc. 3=22801
- Mössbauer effect, impurity nuclei, temp. Green functions 3=25173
- Mössbauer line intensity, effect of thermal oscillations 3=3339
- neutron reflection intensity effect of thermal oscillations 3=3339
- of normal metals, conc., phase boundaries 3=8915
- organic compounds, in paraffins, quasilinear spectra at low temps. 3=18012
- phase transformations, order–disorder, f.c.c. lattice, appl. of nonlinear integral equations 3=18347
- quenching defects, effect on pptn. 3=8909
- with solute particles, acoustic dispersion and elastic-wave attenuation 3=2727
- spinel-type, slow-neutron scattering, rel. to composition and degree of inversion 3=20830

Solid solutions — contd

- strain ageing, solute atom segreg. 3=5139-40
- structure, wave-functions round dissolved atom 3=8914
- substitutional cubic, elastic constants and phonon spectrum meas. 3=5054
- substitutional solution hardening 3=11186
- supersat., concept of ideal pre-pptn. 3=8910
- super-saturated, decomposition kinetics, theory 3=20907
- thermal oscillations, effect on X-ray and neutron reflections, and Mössbauer lines 3=3339
- thermodynamics of metallic solns. 3=8885
- vacancy concentration, large, mechanism 3=8916
- X-ray reflection intensity, effect of thermal oscillations 3=3339
- X-ray scatt., by thermal vibrations, theory 3=11250
- zones, planar and spherical 3=8875
- Ag, in Bi₂Te₃, solubility 3=12998
- Au in BiTe₃ 3=17781
- Be, impurity solubility 3=25272
- Bi–Te, rel. to composition 3=3343
- Cr–Ni system, equil. diagram 3=11289
- CsCl type, heat of formation 3=18230
- Cu-base, local atomic displacements meas. 3=3341
- Cu–Be(Au, Ag), annealing stage I, rel. to concentration 3=8468
- Fe–Al, mechanical strength 3=6798
- Fe, Ce distrib. on sub-boundary zones 3=20229
- Fe–Ni–C system, thermodynamics 3=5117
- Ge in α-Fe, X-ray, metallographic, microhardness, and magnetic meas. 3=3340
- H–D systems, solid-liquid phase diagrams 3=21612
- Hg[*Cd*]Te–In₂[Ga₂]Te₃, structure and semicond. properties 3=11301
- HgTe–MnTe, zinc blende type, phase diagram 3=13543
- K (Mn, Co, Ni) F₃, superexchange interaction 3=25553
- Mg–Fe eutectic meas. 3=11299
- Nb–N, terminal, metal–gas equil. 3=11298
- PbSe–Bi₂Se₃ system, rel. to composition 3=25742
- PbTiO₃–LaAlO₃ phase diagram 3=20767
- Sb–Te, rel. to composition 3=3343
- Se₂O₃–Ga₂O₃ system, phase equil. relns. 3=12001
- Si–Ni, Ni solubility, 900° to 1350°C 3=3338
- Sn, grain boundary segreg. of Ti 3=16118
- Sn–Ag alloys, solute distrib. after solidification 3=16119
- ThO₂–CaO dielec. and mechanical relaxation 3=20700
- Ti–Cr alloys, β-type 3=22898
- UO₂, with foreign elements, in U₃O₈ → UO₂ trans-form. 3=25765
- ZnFe₂O₄–NiFe₂O₄ system, superparamagnetism 3=8645
- ZnSb–CdSb system 3=1348
- ZnSe and ZnTe, in CdS, solubility 3=4886

Solids

- See also Crystals; Films, solid; Metals; Plastics; Powders; Semiconductors; Vitreous state.
- atoms, relaxation, radiation and thermal interaction 3=20070
- brittle, single fracture, fragment size 3=1239-41
- compressibility, at high pressures 3=23311
- deformable, weightlessness 3=16440
- devices, microwave, review 3=6556
- elastic constants and thermal expansion, interrelationship 3=11130
- elastic limit, meas., for imperfect solids 3=8760
- electrical current, space-charge-limited flow 3=15527
- electron scattering, inelastic, energy distrib., rel. to atomic number 3=14659
- field emission, spectrometer, especially semiconductors 3=5691
- fluctuations, conference, Minnesota (1962) 3=6446
- gyroelectric media, plane-wave propag., optical props. 3=3896
- interaction with radiation, rel. to physical properties; review 3=2841
- internal energy exchange, from elastic waves generated by ion and e.m. beam pulses 3=18889
- interphase surface, surface tension 3=11198
- isotropic, coherent nucleation and fluctuations 3=1251
- mass spectrometry, review 3=14685
- Mössbauer spectra, effect of external perturbation 3=15414
- n.m.r. expts. 3=25583

Solids — contd

- neutron scattering, conference, Chalk River (1962) 3=8326
- positron lifetime, variation with pressure 3=10099
- shock-wave propagation 3=11856
- solid state reactions, rel. to crystal lattice defects 3=12956
- textured polycrystalline, thermal stresses 3=2736
- two-phase materials, such as glass-fibre resins, review 3=1209
- ultrasonics, microwave (1-24 Gc/s), generation and propag. in solids, review 3=6470
- viscoelastic, dynamic props., meas. 3=13371
- X-ray spectra, absorption, fine structure 3=6657

structure

- See also Crystal structure; Examination of materials;
- anisotropic media, parameters characterizing geometric properties 3=20765
- diamond, metallic 3=12895
- dimer problem in rectangular lattices 3=6447
- electrographite, after repeated rubbing 3=8787
- ferroelectric crystals, H-bonded, proton -lattice interact. 3=15408
- graphite, effect of bromine absorpt. 3=25309
- gypsum hemihydrate, formation, induction period 3=8790
- ice, surface 3=21307
- interpretation of n.m.r. fine-structure lines 3=8727-8
- Ising lattice, long-range order parameter 3=3249
- molecular crystals, rel. to compressibility 3=15985
- n.m.r. studies in diamag. solids 3=25585
- neutron scattering studies, Chalk River (Sept. 1962) symposium 3=6456
- particle size and number meas. 3=23367
- rare earth hexaborides, data analysis 3=10763
- space group O^2 , representation 3=16051
- sphalerite structure, dislocation cores, theory 3=2793
- spinel, short and long-range order 3=18224
- wüstite, O/Fe ratio rel. to oxygen press. 3=5076
- Al, crystallite orientation distrib. 3=25783
- C, black, particles, internal, and oxides, by electron microscope 3=25804
- C, new phase above 150 kbar 3=18229
- Co^{2+} site preference, effect of anion charge compensation 3=18222
- Cu, quadrupole interaction of nuclei 3=13318
- (Er,Y) $_2O_3$, equiv. Er ions interact. 3=10565
- Fe $_3O_4$ -BaO, phase equilib., 3=6812
- He, γ -phase 3=322
- KNiF $_3$, covalency, LCAO-MO model 3=12893
- KNiF $_3$, covalency rel. to optical spectra 3=12892
- KNiF $_3$, covalent orbitals, n.m.r. study 3=12891
- Li $_2$ (Si,Ge)O $_3$ mixed crystals, one-dim. model 3=10579
- MnN, electron number of N atom 3=12890
- NH $_4$ K $_2$ Li $_{1+x}$, rotation of NH $_4^+$ meas. 3=15418
- NH $_4$ SO $_4$, rotation of NH $_4^+$ meas. 3=15418
- (NH $_4$) $_2$ S $_2$ O $_8$, rotation of NH $_4^+$ meas. 3=15418
- NH $_4$ PF $_6$, rotation of NH $_4^+$ meas. 3=15418
- NaF, distrib. of OH $^-$ ions, meas. 3=18223
- Ni $^{2+}$ site preference, effect of anion charge compensation 3=18222

theory

- actinide elements, using nonrelativistic potentials 3=8194
- adsorption, internal, at grain boundaries 3=1383
- alkali halide crystals, Cauchy's reln. theory 3=25600
- alkali halides, Cauchy relns. failure 3=8750
- alkali halides, ion polarizability 3=12909
- Bloch-Wannier functions, for nondegenerate bands 3=780
- Boltzmann transport eqn. in elec. and mag. fields 3=25226
- Bravais lattice, magnetic, spin configuration 3=25499
- Brownian motion, dynamical study 3=23772
- cubic spinels, Madelung constant calc. 3=2689
- cubic symmetry functions 3=12901
- Debye temp. calc. from elastic consts. 3=20110
- diamond, Ising model, statistics 3=12898
- dielectric props. of cubic ionic cpds 3=8546
- dipolar lattice, statistical mechanics 3=10575
- dipole assembly on vibrating lattice, equil. approach 3=2715

Solids — contd**theory — contd**

- disordered 1-dimensional systems, electronic states 3=22673
- electric current, space-charge-limited, for one type of carrier 3=10709
- electrical conductivity, rel. to current density at optical frequ. 3=8484
- electrical resistance, electron scatt. effects 3=25316
- electron distribution, calc. from atomic model 3=19934
- electron-lattice systems, strongly coupled, motion 3=10587
- electron-phonon system, kinetic eqns. 3=25249
- electron scattering at surfaces 3=8404
- electron state, gaps, in disordered structures, possibility 3=20128
- f-electron terms, ang. momentum degeneracy 3=2749
- ferromagnetic, Hamiltonian, spin wave formalism 3=1130
- focusing collision chains 3=22882
- IV-IV and III-V cpds., many-electron model 3=778
- free energy, anharmonic, at high temps. 3=25163
- hard-metals, refractory, bonding 3=10567
- harmonic generation, second, rel. to electronic band structure 3=25430
- Heisenberg model, mag. suscept., Padé approx. method 3=5005
- hindered molecular rotation in solids 3=15417
- impact ioniz. of centres by electrons 3=8502
- intermetallic cpds. tetrahedral, mol. orbital description 3=776
- ion transition probabs., radiative, in 4f n configs. 3=25482
- ionic crystals, simple, quantum-mech. box model 3=4796
- ionic, luminescent centres, relation of absorption to emission probabilities 3=6666
- ionic, optical absorpt., polaron theory 3=13162
- ionic, shielding and crystal fields at rare-earth ions 3=6453
- ionic, specific energy and multipole lattices 3=10568
- ionization of local levels by elec. field 3=15453
- ions, electronic polarizability 3=12909
- Ising lattice, long-range order parameter 3=3249
- Ising model, dimer statistics 3=14043
- Ising model, free energy, rel. to lattice gas pressure 3=16548
- Ising model, with impurities, spin-pair correl. function 3=25162
- Ising model long-range interact. 3=12899
- Ising model, perpendicular susceptibility 3=8327
- Ising model series, coeffs., asympt. form 3=16546
- Ising model, specific heat, Padé approx. method 3=5005
- Ising model, time-depend. statistics 3=14045
- Ising model, two-dim., spin correlations 3=13239
- Ising systems with long-range forces, stochastic fields 3=23779
- lattice energy current of elastic waves 3=25186
- lattice energy of molecular crystal 3=12897
- lattice statistics, review and exact isotherm 3=12910
- ligand field theory, spin-orbit coupling 3=25161
- magnetic fields at nuclei in metals, alloys 3=8342
- magnetic helical structure, scatt. of polarized neutrons, calc. 3=6718
- magnetoelectric effect 3=17811
- magnetoelectric and thermoelec. props. in tetragonal crystal 3=25317
- masers, optical, review 3=7728
- mean free path, and conductivity, thermal wire, dia. var. 3=22672
- μ^+ -meson depolarization in matter 3=15416
- molecular crystals, close-packed arrays 3=13391
- molecular crystals, excitation-energy migration, rel. to luminescence polarization 3=11000
- nonmetallic, many-electron perturb. theory 3=25239
- n-paraffins, phase transitions 3=16020
- phonon interact. with electron-hold field 3=751
- Pippard's relns. deriv. for cryst. media 3=8357
- plasma acoustic wave amplification, u.s. 3=22633
- quasi-particle motion, in weakly homog. mag. field 3=2702
- range of energetic atoms 3=10571
- rare earth metals, 4f shells, indirect interact. 3=3076
- rare earth metals, virtual bound state model 3=2756

Solids—contd**theory—contd**

- resistance, electrical, impurity, theory 3=22885
- Schottky effect, periodic deviations, numerical analysis 3=424
- second harmonic generation of light 3=15641
- second sound, crit. freqn., macroscopic theory 3=25193
- semiconductors, optical and nonradiative transitions 3=23032
- semi-metals, amplif. of ultrasound in elec. and mag. fields 3=15433
- semimetals, Azbel'—Kaner cyclotron resonance 3=785
- sound amplification by cond. electrons, mag. field depend. 3=25194
- spin coupling, Heitler—London method 3=6385
- spin and harmonic oscill. systems, relax. 3=7137
- spin relaxation, Fokker—Planck eqn. 3=1623
- tensor non-linear relations, anisotropic 3=22619
- Thomas—Fermi theory for particle density 3=697
- III-V compounds, mol. effective charge and atomic polarizabilities 3=17637
- transport coeffs., thermal Green's functions 3=23804
- transport processes, quantum theory 3=12938
- tunnelling through thin films with traps 3=825
- two-spin system, relaxation 3=1624
- ultrasonic microwave interaction with electron spins 3=8351
- vacancy formation energy, 3-body interact. 3=20163
- valency, impurities or lattice defects, i.r. absorpt. 3=10928
- Van der Waals, paramag. impurities, variational theory 3=25274
- vibrational modes in disordered systems 3=10582
- Vlasov equation for crystal density variation 3=17639
- Wannier functions, generalized, orbital theory 3=6452
- weak-coupling rate eqns., initial conditions 3=12935
- Cr₂O₃, mag. and optical props., ion pair model 3=25503
- CsCl structures, Grüneisen parameters rel. to temp. 3=4826
- CsI, quantum-mech. box model 3=4796
- H, cooperative transition phenomena 3=6450
- KNiF₃, covalency, LCAO—MO model, 3=12893
- LiF, quantum-mech. box model 3=4796
- MgO, F-centres, Γ_1^* and Γ_2^* state wave functions 3=25301
- MnB, covalent 2sp bonding 3=6488
- NaCl, eqn. of state, Grüneisen const. 3=25205
- NaCl, equation of state 3=15447
- NaCl, quantum-mech. box model 3=4796
- Si, model, effects of uniaxial strain 3=4797
- Sn, grey and white, interreln. 3=11209

Sols

See also Colloids; Sedimentation.

- disperse systems, ionization equilibrium 3=21696
- hydrosols, number concn., particle size analysis 3=3415
- AgBr, monodisperse, higher order Tyndall spectra 3=13629

Solubility

See also Phase equilibrium.

- crystals, radiation effects 3=20188
- gas in low-temperature liquid, meas. apparatus, down to 14°K, up to 10 atm. 3=9453
- gases, in polyethylene terephthalate 3=11305
- gases, vapours in liquids, det. by gas chromatography 3=3798
- gelatine, in distilled water, effect of α -rays 3=5170
- inert gas in a metal 3=25314
- inert gases, in sea and fresh water 3=23877
- naphthalene, in compressed gases 3=304
- Noyes—Nernst equation, modification 3=11787
- quartz particles 3=16128
- transition elements in liq. Al, soln. rate 3=16614
- Be, impurities 3=25272
- C in Ni and Ni + Fe 3=5117
- CaF₂, fluorite, solubility in aq. electrolytes 3=23874
- Co binary solid solutions, with Al, Ga, Si, Ge, Sn 3=16121
- Cu, in InSb, substit. and interstit. 3=17783
- Fe, in Mg, solid, maximum 3=11299
- GaSb, GaAs and GaP in liq. Ga 3=21333
- Ge, of impurities, maximum, and m.p. distrib. coeff. 3=20910

Solubility — contd

- H, in Pd, phase transformations, isotherms hysteresis 3=25750
- H₂ in Cu 3=20220
- He in H, temp. correction 3=24112
- HfC—UC at 2000°C, meas. 3=25759
- InAs, InSb and InP, in liq. In 3=21333
- Li in GaAs rel. to Zn and Te doping 3=10818
- LiF—KF molten system, molar mixing enthalpies 3=21338
- N₂, in Be, X-ray diffraction study 3=20908
- N₂ in H₂O, isotope effect 3=9450
- NH₃, in water, equil. between vapour and soln. 3=21336
- NaOH, in water, rel. to freezing point 3=7387
- Ni, in Be, X-ray diffraction study 3=20908
- Ni in Si, solid, 900° to 1350°C 3=3338
- O₂, in Be, X-ray diffraction study 3=20908
- O₂ in H₂O, isotope effect 3=9450
- O₂ in Si 3=15579
- O₃—CF₄ liquid system 3=21334
- Si, of impurities, maximum, and m.p. distrib. coeff. 3=20910
- Te, in Ge 3=2825
- Ti, in Be, X-ray diffraction study 3=20908
- Y, in Be, X-ray diffraction study 3=20908
- Zn, in GaAs 3=16122
- Zn, in GaP 3=10686
- Zr, in Be, X-ray diffraction study 3=20908

Solution energy

See Heat of solution.

Solutions

See also Heat of solution; Liquids; Solid solutions.

- acetone, in various solvents, dielec. props., structure 3=21386
- activity coeffs., for binary, thermodynamic, consistency, 15 tests 3=11788
- aliphatic primary alcohol—CS₂ binary system, miscibility gaps 3=23875
- alkali halides, supersaturated, latency times 3=21339
- alkali metal in molten alkali halide, conductivity, electrical 3=18829
- amine—chloranil complexes, absorption spectra 3=1694
- anthracene, dilute, Kramers—Kronig relation 3=16627
- aqueous, e.s.r. spectrometers, sensitivity 3=17063
- aqueous, hydrated electron, absorption spectrum 3=6926
- aqueous, photo- and radiation chem. conversion of solvated electrons into H atoms 3=3405
- aqueous, pressure effects on charge-transfer and transition metal ion spectra 3=1690
- aqueous, proton hydration enthalpy 3=21337
- aqueous, X-ray irradi., yield of e and H atoms 3=3410
- asphaltene, electron-proton double resonance 3=7221
- azide, photolysis of aqueous solns. 3=6922
- binary metal solns., free surface energy, statistical electron theory 3=23485
- binary mixtures, eqns. of state 3=9451
- binary solutions, molec. scatt. power, in Raman scatt. 3=21372
- capillary flow, exptl. re-evaluation 3=16597
- cellulose acetate in acetone, u.s. vels. 3=14161
- collidine, in water, conc. fluctuations, ligh-scatt. study 3=21365
- complex organic cpds., viscous, photodichroism 3=23881
- copolymer, sequence, study by light scattering 3=18443
- critical props. of mixtures 3=16844
- diffusion, of 3 ion species 3=21327
- dinitrobenzene, e.s.r. splitting consts rel. to colls. with solvent molecules 3=4776
- diphenylanthracene/o-xylene solns., quenching and energy transfer 3=1702
- electrolytes, i.r. spectra, ionic interactions with solvent molecules 3=21375
- electrolytes, solvent dielec. const., effect on viscosity 3=21341
- ether solutions of K metal and of naphthalene dianion, flash photolysis 3=16180
- ethyl cellulose in methyl alcohol 3=14161
- fluorescein, spectra, by quantum chemistry 3=2647
- fluorescein, viscous solns., fluorescence 3=1697
- fluorescence, yield rel. to exciting wavelength, theory 3=1695

Solutions — contd

- free energy of nonequilibrium polarization systems 3=16169
- free radicals, e.s.r., and h.f.s. 3=14183
- frozen aq. solns. of S cpds., e.s.r. study 3=15392
- hexamethylenimine, in water, conc. fluctuations, light-scatt. study 3=21365
- internal field, effect on electronic spectra of solute molecules 3=21373
- ionic hydration meas. for 16 ions 3=5435
- ion-solvent interaction 3=16612
- ions, partial molar volumes, rel. to Born model 3=23873
- of large molecules, capillary and porous flow, solute velocity increase 3=113
- light scattering, rel. to diffusion and u.s. absorption 3=21368
- light scattering, theory 3=23882
- liquid—liquid and solid—liquid, law of mixtures 3=21342
- liquified gases, thermodynamic properties 3=14145
- lithium halides, aqueous, u.s. velo., adiabatic compressibility 3=18812
- luminescence, excited-unexcited mols. interact. 3=1701
- luminescence quenching rel. to viscosity 3=16632
- isopropanol in polymers, H-bonding and i.r. spectra 3=12853
- macromolecular, dimensions of coil in laminar flow 3=21348
- macromolecular, orientation birefringence in shear flow and elec. field 3=16617
- macromolecules, specific vol., apparent 3=14154
- macromolecules, strain birefringence, theory 3=5441
- macromolecules, viscosity, as function of vel. gradient 3=14157
- mass transfer, turbulent, near boundary 3=3791
- metalammonia electron spin relaxation and diffusion 3=21414
- metals, heavy, halide salts, luminescence 3=10990
- Metals, in NH_3 , e.s.r., effect of adding electrolyte 3=11811
- microstructure, rel. to Rayleigh light scatt. 3=21364
- molecular diffusion controlled, moving boundary effects 3=5436
- multicomponent, isothermal diffusion 3=11785
- n.m.r. of O^{17} , solvent effects 3=11810
- naphthalene, in durene, radiationless triplet—singlet transitions 3=23115
- nitrate electrolytes, aqueous, u.s. meas. 3=11792
- nitrobenzol, in hexane, dielec. props., structure 3=21386
- nitrobenzol in n-heptane, light scatt. and extinction coeff. 3=21367
- nonelectrolyte, averaged Boltzmann-factor theories 3=16613
- nuclear mag. resonance of O^{17} in various solutions 3=148
- optical extinction, measurement 3=21367
- optical rotation, meas. for high-scatt. 3=16807
- organic, luminescent, for scintillators, non-radiative transfer 3=10001
- paraffins, normal, optical anisotropy, from Rayleigh scatt. 3=136
- paramagnetic complexes, proton mag. reson. 3=14186
- paramagnetic, n.m.r. 3=21413
- photo-ionization and electron capture processes in solution 3=16180
- β -picoline, in water, conc. fluctuations, light-scatt. study 3=21365
- polar polymers, thermodynamic props. 3=11790
- polar polymers, thermodynamic props. 3=14158
- polybutyl methacrylate-isopropanol, critical opalescence 3=21353
- polyelectrolyte, diffusion of ions, theory 3=9447
- polyelectrolytes, interaction of neighbouring charged groups, effect on props. 3=21345
- polyelectrolytes, volume effect theory 3=21346
- poly- γ -benzyl-L-glutamate in m-cresol, viscosity 3=135
- poly-1-butylene-benzene, optical props. and viscosity 3=21352
- polymer chains, configurational props. 3=15404
- polymer, conc., entanglement effects 3=18809

Solutions — contd

- polymer, hydrodynamic interaction, effect on viscoelasticity 3=18810
- polymer, in poor solvents, intrinsic viscosities 3=21350
- polymer, second osmotic virial coeffs. rel. to mol. weight 3=3802
- polymer, 2nd virial coeff. of branched star molecules 3=1686
- polymer, statistics of configuration and free volume 3=10562
- polymer, streaming birefringence, anisotropy 3=16618
- polymers, specific vol., apparent 3=14154
- polymers, u.s. vels. 3=14161
- polymers, viscosities near crit. temp. 3=21349
- polymers, viscosity rel. to temperature 3=18811
- polymers, viscoelasticity at high press., u.s. meas. 3=14156
- polymethyl methacrylate-butyl chloride, critical opalescence 3=21353
- polymethylmethacrylate in diphenyl, viscosity rel. to shear stress 3=16619
- polymethylmethacrylate, viscosity and light scatt. 3=134
- polypeptides, helical, Cotton effect, origin 3=2681
- polystyrene-cyclohexane, critical opalescence 3=21353
- polystyrene-cyclohexane, optical props. and viscosity 3=21352
- polystyrene, dilute soln. props. in θ -solvents 3=16616
- polystyrene, second virial coeff. calc. 3=16615
- polyvinyl acetate in benzene, u.s. vels. 3=14161
- porphyrins, luminescence 3=9467
- pyrene in ethanol, luminescence, delayed and normal, spectra 3=14174
- radiolysis of aqueous azide soln. containing mercuric salts 3=16181
- Rayleigh light scattering, and soln. stability 3=21368
- Rayleigh light scattering, in region of critical opalescence, meas. 3=21367
- refractive index meas., incremental 3=14323
- rhodamine B, decoloration by pH changes 3=23536
- of rigid rodlike molecules, viscosity 3=135
- solute distrib. under external forces, theory 3=3799
- solvation, entropies and electrostatic volumes 3=9452
- solvent relaxation during solute excited lifetime, fluorescence spectral effects 3=9468
- Taylor instability, effect of diffusion 3=11789
- thermoelectric powers, initial, acids, strong 3=14181
- triethylamine, in water, conc. fluctuations, light-scatt. study 3=21365
- u.s. absorption, pulse apparatus and data 3=230
- uranin, fluorescence depolarization by mol. rotation 3=139
- viscous, photodichroism, reversible, stationary value, calc. 3=16625
- AgBr precipitates, adsorption of H^+ and OH^- ions 3=5165
- AlCl_3 in SOCl_2 , Raman spectra, 0.11-0.73 mole per mole 3=14170
- Al—Cu alloys, liquid, 1000°C, Cu activity 3=14152
- Ar— CH_4 , heat of mixing and volume change 3=1682
- BeCl_2 , aq., structure from Raman spectra 3=9463
- BeF_2 , aq., structure from Raman spectra 3=9463
- Bi—BiI₃, electronic conduction in melts 3=11806
- Bi—BiI₃, elec. cond. of molten solns. 3=11805
- Bi—BiI₃, molten, mag. susceptibilities 3=11807
- CO— CH_4 , heat of mixing and volume change 3=1682
- CO_2 , aq., optical rotation, effect of circularly polarized light 3=1688
- CoSO_4 , aqueous, absorp. of acoustic waves, u.s., and dissociation 3=14160
- Cs^+ salts, e.s.r. 3=3818
- Cs, in NH_3 , e.s.r., effect of adding CsI 3=11811
- DT, in e-D₂, vapour-liquid equilibria, from triple pt. to crit. temp. 3=21626
- Fe^{2+} , Fe^{3+} , in water, electron transfer, theory 3=14178
- Gd^{3+} perchlorate, hydration geometry, from n.m.r. 3=18832
- H isotopic equation of state, including quantum effects 3=21321
- H—D systems, solid—liquid phase diagrams 3=21612
- H_2 —D₂, density, m.p. to 2.04°K 3=21343
- HCl, in water, D substitution, effect on glass transform. temp. 3=23492

Solutions — contd

- HT, in e-H₂, vapour-liquid equilibria, from triple pt. to crit. temp. 3=21626
 He isotopic equation of state, including quantum effects 3=21321
 He II-He³, diffusion data analysis 3=1881
 He³-He II, first-sound absorption 3=3943
 He³-He⁴, thermal cond. and diffusion, λ -pt to 0.6° K 3=3939
 Hg, dilute, surface tension, temp. depend. 3=21340
 In sulphate, nitrate and perchlorate, aq., Raman spectra 3=7211
 K, in NH₃, e.s.r., effect of adding KI 3=11811
 KCl, aq., freezing 3=3927
 KCrO₄, magnetic susceptibility 3=146
 KMnO₄, magnetic susceptibility 3=146
 K₂(SO₄)₂, aq. solns., electron spin exchange 3=16639
 LiNO₃, aqueous, compressibility, adiabatic, lowering 3=18807
 MgSO₄, aqueous, sound absorpt., relax. theory 3=23879
 Mg²⁺ in methanol, solvation number, by n.m.r. 3=1685
 N₃⁻, absorption spectrum 3=21377
 (NH₄)₂Cr₂O₇, magnetic susceptibility 3=146
 Na, in NH₃, e.s.r., effect of adding NaI 3=11811
 Na-NH₃, proton resonance 3=7222
 Na₂Cr₂O₇, magnetic susceptibility 3=146
 Na₂SO₄-H₂SO₄-H₂O, isothermal diffusion 3=1680
 Nd chloride, in alcohol-water, absorption spectra, temp. depend. 3=21374
 NdCl₃ in alcohol-water solutions, absorption spectra 3=18816
 Ne-nD₂, liquid system, phase separation 3=3801
 Pb, dilute, surface tension, temp. depend. 3=21340
 SO₂, in water, D substitution, effect on glass transform. temp. 3=23492
 Sn, dilute, surface tension, temp. depend. 3=21340
 Ti₂SO₄-H₂O system, sedimentation meas. 3=5172
 VOCl₃, aqueous, e.s.r. line shape rel. to com and temp. 3=150
 WCl₆, liquid and supercooled, paramag. reson. 3=21407
 ZnCl₂, aq., freezing 3=3927

Sorption

- See also Adsorption.
 chemisorption kinetics 3=23544
 chemisorption, method 3=20995
 desorption energy spectra, thermal resoln. 3=13575
 desorption-rate of gases, "flash-filament" invest. 3=1391
 field desorption, theory 3=13570
 gases, in polyethylene terephthalate 3=11305
 metal films, evaporated, conference Liverpool 1963 3=25778
 ion exchange kinetics, revised tables 3=13588
 ion sorption, re-emission 3=9518
 metals filaments, meas. by controlled flash heating 3=7379
 pumping at solid surfaces 3=21454
 vacuum gauges, Bayard-Alpert, ion, Ar, N 3=23946
 CO on Cu, Au films, surface potential diode meas. 3=13602
 CdSe-O₂, charge transfer controlled interact. 3=11326
 Cu, chemisorption, rel. to oxidation 3=18435
 Ga, on Zn, Cd and Sn, crack growth 3=20757
 H on Co, chemisorption 3=5163
 H on Cu, Au films, surface potential diode meas. 3=13602
 H₂, in Th₂Al, equil. pressure isotherms 3=20941
 Hg, on Zn, Cd and Sn, crack growth 3=20757
 MgO, neutron irradiated, sorption of O₂, H₂, N₂O 3=13604
 by Ni films, of O₂ and BaO, effect on elec. resist. 3=20271
 Ni oxide, chemisorption of O₂ 3=13573
 NiO, chemisorption of O₂ and H₂ after neutron irradi. 3=3366
 NiO, neutron irradiated, sorption of O₂, H₂, N₂O 3=13604
 NiO, of H₂ 3=13603
 NiO, of O₂, 20-400°C 3=13603
 O on W, chemisorption, 20° and 300° K 3=3396
 S vapour on Ni to give NiS, diffusion process 3=1387
 Th, on Re, thermal desorption 3=21856

Sound ranging — contd

- sonar eqn., energy content of pulse 3=9551
 sonar eqns., generalized form 3=3854-5
 submarine detection, early 3=14278

Sound recording

- spectrograph, amplitude contour display on teledeltos paper 3=1779
 visual display system 3=14283

Sound reproduction

- See also Acoustic radiators; Acoustic transducers; Sound recording.

frequency-dividing networks 3=23981

Space charge

- appearance potls., meas. by space-charge compensation 3=14664
 arcs, low-press., positive column sheath 3=4057
 in CdS, thermal release of trapped charge 3=4949
 in dielectrics, conference report 3=4935
 dielectrics, rel. to nuclear radiation 3=17923
 elec. double layer, potl. and elec. field distrib. 3=1392
 electron beam, gap interaction with e.m. fields, linear theory 3=5696
 electron beam, signal-current-excited, wave decay 3=16982
 in electron beams, ion compensation, electron current multiplication 3=19338
 electron diodes, space-charge instabilities 3=24348
 electron gun, correction, first order 3=21872
 gas diode, space-charge-limited emission 3=21869
 gases, elec. precipitation, dust space charge 3=24202
 in hot cathode gas discharges, high press. 3=9738
 liquids, distrib., pressure analysis 3=9479
 mass spectrometers, velocity modulation type 3=2055
 metals, electron density rel. to elasticity theory 3=5053
 in microtrons, electron packets 3=4229
 in Penning-type tubes, effect on electron kinetics 3=21871
 plasma sheath, elec. field and thickness 3=12113
 plasma, waves, collision damping, calc. 3=5666
 thermionic emission, electron space charge 3=9887
 thermionic energy converter, reduction 3=9713
 thermoelectric energy converter, calc. 3=9718
 transaxial electrostatic systems, main properties, theory 3=19341
 vacuum diode, electron and ion emission 3=21868
 waves, in relativistic Brillouin beams 3=5697

Space research

- See also Atmosphere.
 artificial electron injection as research aid 3=16238
 atmosphere, water, total, above desert, Sahara, from Tiros III 3=18493-4
 British work, review lecture 3=7053
 cosmic rays, future problems 3=4548
 cosmic rays in interstellar medium 3=19718
 desert, Sahara, soil temperature, and i.r. radiation, Tiros III 3=18493-4
 Discoverer 17, nuclear reactions induced by solar protons 3=7951
 Earth-to-moon trajectories, 3-body problem 3=25991
 electron density, 1000 km, from top-side ionograms 3=11421
 human aspects, physiological and psychological 3=16433
 liquid surface shape under diminishing gravity 3=9288
 magnetic field, review 3=25937
 man in space, review of possible radiations 3=3633
 Mariner II, preliminary observation 3=7054
 plasma probes on vehicles, rel. to ionospheric meas. 3=7571
 radiation hazard below 350 km 3=23638
 radiation, high-energy, Mariner II meas., Sept-Oct., 1962 3=22231
 review 3=11608-9
 setting sun, effect of refraction, as seen from space 3=23591
 technology, symposium, Hatfield 1962 3=16433
 u.v. and X-ray photometry, by rockets and satellite, U.S. Naval Research Laboratory 3=11481
 UK 1 satellite, programme 3=1547
 vacuum u.v. radiation physics, conference 3=5515
 water drop shapes under low gravity 3=18668

Sound

See Acoustics.

Sound ranging

- multiplicative arrays 3=9261
 projector arrays, erratic velocity distrib. 3=219

Space vehicles

- See also Rockets; Satellites, artificial.
 azimuthal aiming system for launching 3=18667
 danger from cometary debris, assessment 3=23679
 dog-carrying, radiation doses meas. 3=3634
 entry into elliptic lunar orbit, impulse 3=23714
 materials, review 3=16433
 navigation, review 3=16433
 plane wave scatt. from vehicle with plasma sheath 3=7703
 radioactivity, induced, 15 days meas. 3=21135
 shielding against radiations in space 3=21139
 single-stage spaceships, propulsion 3=21138
 solar heating of rotating spherical satellite 3=7056
 Soviet, general data 3=3630
 structure design aspects 3=16433

Instrumentation

- actinometric devices, temp. and press. depend. 3=21609
 for analysis of elements on moon's surface 3=21096
 dosimeters 3=24557
 earth spectra, i.r. horizon 3=16435
 γ -ray telescope, high-energy 3=21146
 Geiger counter in Injun, efficiency 3=16436
 magnetic field meas. 3=25937
 magnetometers, motion of frame of reference 3=21140
 Mariner II, Anton 213 GM tube 3=11616
 multichannel analysers 3=19144
 orbiting solar observatory, instruments 3=9286
 photometer, photoelec., multicolour 3=16726
 and planets, radiation, h.f., l.f., noise 3=16348
 power sources, nuclear and non-nuclear 3=21144
 radioastronomical aerials, effective area 3=23703
 range switching, automatic 3=13940
 Ranger 3 and 4, γ -ray spectrometer 3=21145
 re-entry radio blackout, elimination 3=7059
 spectrometers, grating, solar 3=11615
 sum-vector referenced guidance system 3=7058
 television recording of moon and planets 3=7014
 vacuum-system remote-opening device 3=3842
 weight, power limitations, sterilization 3=21143
 X-ray spectrometer for soft solar spectrum 3=9152

Spallation

See Nuclear spallation.

Spark chambers

- air-gap type, efficiency 3=19526
 for cosmic-ray lecture demonstrations 3=22221
 data processing, computer 3=19519
 digitized, using wires carrying mag. cores 3=19527
 discharge prod. along particle tracks 3=24566
 for emulsion entrance coord. meas. 3=17159
 ferrite core memories to record spark locations 3=10009
 foil, in magnetic fields, pulsed, high 3=19530
 four-gap with acoustic probes, cosmic ray tracks 3=2178
 gas discharge avalanche, delineating 3=19532
 inclined discharge channels 3=24564
 ionization density rel. to track brightness 3=19525
 for K meson bubble chamber track labelling 3=17339
 large mag. field, design, construction, performance 3=17145-6
 large in terelectrode spacing, for inclined tracks 3=17151
 magnetic field, 18 kG, 128 gaps 3=17144
 in magnetic fields, sensitive time 3=14838
 memory time, recovery 3=10008
 for mesons, K⁻-p, 700-1400 MeV/c 3=24790
 modular, construction and use 3=17143
 for momentum meas. of charged particles 3=17150
 Ne-alcohol, characteristics 3=14837
 neutrino, CERN 3=24690
 optical system, stereo, in mag. field 3=17149
 optical viewing system, for magnet economy 3=17147
 pulsed mag. field, 20-100kG, effect of 3=7751
 relative ionization, use, Λ^0 and K^0 decays 3=17140
 review 3=17138
 scanning, t.v.-film 3=19528
 sensitive time reduction, effect of Ar-O, Ar-N mixtures 3=17139
 shower detection efficiency 3=17141
 simultaneous particles, efficiency for 3=19531
 sonic 3=17142

Spark chambers — contd

- spaced, thin plate, for track angle meas π -p scatt. 3=24565
 spectrometer, mag., for π - π interaction 3=17326
 track follower 3=19529
 uses, high-energy 3=17148
 wire, carrying mag. memory cores 3=19527

Spark counters

See Counters, spark

Sparks, electric

See also Breakdown, electric; Lightning.

- air, intense light flashes, energy-time relation 3=21742
 Al, dislocation formation 3=12969
 Bi, dislocation formation 3=12969
 brightness temps., peak, 4500-3000 A 3=4053
 capillary and surface spark, as nsec light sources 3=11905
 channel decay after current passage 3=9748
 channel heating by shock waves 3=21740
 column, temp. and conductivity meas. 3=1948
 electroerosion effect with RC type circuit 3=7473
 gap recovery, high-current 3=4049
 gap switch, low-pressure, with wide voltage range 3=4048
 gas mixtures, ignition, effect of capacity and induction components 3=5639
 hot-wire triggered, very high voltages 3=4050
 in hydrogen, formative time lag meas. 3=9736
 in H, reignition of freely recovering spark channels 3=14544
 intensity increase and duration reduction 3=14547
 ion source, for mass spectrometer 3=16989
 ion source, pulsed, multicharged 3=2046
 as light source, for atomic absorption spectra 3=11923
 long, impulse corona and pre-breakdown mechanism 3=24246
 low inductance, sliding, vacuum u.v. light source 3=11921
 low-voltage, for spectrochem. analysis of hard-to-excite elements. 3=25843
 magnetically controlled spark gap 3=21741
 miniature, high power, channel broadening 3=16913
 negative, in air, 1-3 m, photographic study, lightning comparison 3=21738
 repeating discharge, dielec. strength recovery 3=21743
 small, intense, channel expansion 3=9749
 spark channels in air, current density, gas temps. 3=1949
 spark conditioning eqn., plane electrodes in vacuum 3=14545
 spark gaps, low-pressure, triggering mechanism 3=4051
 spectral line broadening and ion concn., time variation 3=2553
 spectral lines, self-absorption and intensities 3=10440
 spectrochem. analysis source unit. 3=25842
 spectrochemical analysis, metals, surface phenomena. 3=25844
 switches, fast triggered, for 2MJ capacitor bank 3=7471
 temperature decay of high-current channels 3=21739
 trigatron spark gap, discharge development 3=24248
 vacuum cup electrodes, effect of graphite adsorpt. 3=13631
 W, far u.v. continuous emission, spatial distrib., apparatus 3=24249
 Xe, h.f. discharge repetition, spark channel explosions 3=1950
 Zn, dislocation formation 3=12969

Specific heat

See also Thermodynamic properties.

- ABX₂ covalent compounds 3=2739
 alkali halides, Debye temps., temp. depend. 3=22667
 alkali halides, rel. to spectroscopic behaviour 3=754-65
 alkali halides, with NaCl structure 3=8350
 alkali metals, liquid, heat capacities 3=23870
 alkali metals, low-temp., theory 3=12947
 alloys of transition elements in normal metals, low temp. anomalies 3=8496
 antiferromagnet, specific heat rel. to suscept. 3=3142
 antiferromagnets, mag. field depend. 3=3143
 boson gas, Hartree-Fock theory 3=18751
 Boyle's-law gas 3=11831
 C_v[T,V(T)], conversion to C_v[T,V(0°K)] 3=6476
 clathrates, β -quinol, of N₂, CO, CH₄, 15°-100°K 3=8284
 constantan, heat capacity, 0.15°-4.2°K 3=20107
 corundum, 500-2000°K 3=20103
 crystal lattice statistics, 7 models 3=12910

Specific heat—contd

- crystals, Debye char. temp., Post's method 3=772
 crystals, Pippard's relns. deriv. 3=8357
 at Curie point, const.-coupling, calc. 3=20108
 Debye temp. calc. from elastic const. 3=20110
 Debye temp., from l.f. elastic velocities 3=8369
 Debye temp. III-V compounds, from elastic moduli and lattice const. 3=22666
 diamond, Ising model, statistics 3=12898
 diamond, from spectrum, i.r., vibr. freqs. 3=18003
 1, 2-difluorobenzene 3=8291
 electron gas of intermediate density, calc. 3=753
 f.c.c. and two -dim. square lattices, Grüneisen coefft. 3=25204
 films, solid, thermal vibr. theory 3=12923
 graphites, 0.4°-2.0°K, meas and theory 3=12925
 Grüneisen const., free volume theory 3=25203
 Ising model, singularity, Padé approx. method 3=5005
 liquids and dense gases, hole theory 3=18800
 liquids, rel. to collective movement theory 3=129
 manganin, heat capacity, 0.2°-4.2°K 3=20107
 measurement 50°-850°C, adiabatic calorimeter 3=18831
 measurement, solids, molar, calorimeter, 10°K-290°K 3=21607
 metals, Debye temp. rel. to cold neutron scatt. 3=4823
 metals, electron interaction effects, calc. 3=753
 metals, filaments, meas. by controlled flash heating 3=7379
 metals in mag. field, electronic contrib. 3=22664
 paramagnetic salts, spin-system heat capacity, exper. test of Van Vleck's formula 3=22665
 polyethylene, low temp., from force const. 3=8366
 polymers, linear, low temp., from force const. 3=8366
 polypropylene, atactic and isotactic, rel. to structure 3=10597
 polypropylene, rel. to γ -irradiation 3=2728
 rare-earth ethylsulphates 3=25579
 solids, rel. to methyl group internal rotation barriers 3=25197
 solids, rel. to sample size 3=17657
 solids, theory of surface sp. ht. 3=6475
 superconductors, anomaly at supercond. transition 3=14445
 superconductors, rel. to electron-phonon interact. 3=3950
 thermal capacity, saturated isomerizing vapour 3=11833
 transition metals, superconducting, meas. 3=7405
 Ag, Grüneisen ratio rel. to volume, calc. 3=4828
 Ag₂O, large crystals 14°-300°K 3=768
 Ag₂O, 2°-80°K, rel. to particle size 3=769
 Ag₂Se, 30°-200°C 3=2926
 Ag-Zn, β , β' and ζ -phases 3=8396
 Al, calc. by de Launay's method 3=2714
 Al, Debye temp., from electron diff. meas. 3=22656
 Al, near supercond. transition point 3=12029
 Al, superconducting, up to 1 at.% impurities, and forbidden band anisotropy 3=19106
 AlSb, atomic, 12-273°K 3=12928
 Ar, from acoustic velocity 3=16659
 Ar, C_v meas. near critical pt. 3=1729
 Ar, Grüneisen const., Born's theory 3=25203
 Ar, solid, vacancy contribution 3=8364
 (Ba_xSr_{1-x})TiO₃ 3=2957
 Be, const. vol., from lattice vibr. spectrum 3=10578
 BeO, Debye temp. for neutron scatt. 3=12911
 BeO, irradiated, below 4°K, and He diffusion after annealing 3=15509
 BeO, 298-1200°K 3=25196
 CH₄ β -quinol clathrate, 15°-100°K, and CH₄ motion 3=8284
 CO₂, effect of H₂ and D₂ on relaxation time 3=16658
 CaCO₃, 1.6° to 70°K, rel. to antiferromagnetic transition 3=17659
 Cd, 1.5-4.2°K, Debye temp. 3=2733
 Co β -quinol clathrate, 15°-100°K, and CO motion 3=8284
 CoCO₃, 1.6° to 70°K, rel. to antiferromagnetic transition 3=17659
 Cr, electronic sp. ht. 3=8363
 CrCl₃, 11°-300°K 3=1061
 CsCl structure, Grüneisen paramaters rel. to temp. 3=4826
 CsI, quantum-mech. box model 3=4796

Specific heat—contd

- Cu, calc. 3=6476
 CuCl₂, 11°-300°K 3=1061
 Cu-Co alloys, <4°K 3=8635
 Cu, impurities 3=22700
 Cu(NH₃)₄SO₄, at low temp. 3=1060
 α -Cu-Zn alloys, meas. below 4.2°K 3=17660
 β -CuZn, below 4.2°K 3=766
 D₂, solid, para-enriched, λ -anomaly 3=2732
 Dy, spin wave specific heat eval. 3=3095
 Dy₂O₃, lattice and electronic contribs. 3=20106
 Dy₂Al₂O₇, anomaly near Néel temp. 3=15436
 Er ethylsulphate 3=4799
 Er₂O₃, lattice and electronic contribs. 3=20106
 EuS, spin-wave contribution 3=2729
 Fe, discontinuity at Curie pt. 3=23136
 Fe, 800°-1420°C meas. 3=10598
 Fe, meteoritic 3=11526
 Fe, α -phase, de Launay's model 3=22641
 Fe, α -phase, Debye temp. by X-ray diff. 3=17662
 Fe silicides, temp. depend., 55-300°K 3=8360
 Fe, sp. ht. -temp. curves 3=13244
 FeCO₃, 1.6° to 70°K, rel. to antiferromagnetic transition 3=17659
 Fe-Ni solid solutions, electronic 3=8367
 Fe₂O₃, contrib. of spin-wave dispersion 3=25200
 Fe-Re, nucl. mag. sp. ht., mag. field at Re nuclei 3=6479
 Fe-Sb, nucl. mag. sp. ht., mag. field at Sb nuclei 3=6479
 Ga, 20-700°C 3=22659
 Ga chalcogenides 3=25825
 GaAs, atomic, 12-273°K 3=12928
 GaAs, Debye temp., neutron scatt. data 3=25201
 GaSb, Debye temp., neutron scatt. data 3=25201
 GaSb, 20-700°C 3=22659
 Gd, 0.4°-4°K, meas. and theory 3=8368
 Gd₂O₃, 10°-350°K, electron and lattice contribs. 3=20105
 Ge, atomic, 12-273°K 3=12928
 Ge, Debye temp., X-ray data 3=11257
 H₂ and D₂, -175° to 150°C, up to 2500 atm 3=23930
 H₂, constant vol., 15-90°K, up to 340 atm. 3=11784
 H₂, liquid, normal and para, C_v/C_p 3=23880
 He, behind strong shock front, calc. 3=16699
 α He³, anomalous, rel. to lattice defects 3=8422
 He³-He⁴ mixture, solid 3=323
 He³, liq., 0.015°-0.3°K meas. 3=12016
 He³, liquid, 0.054°-0.3°K 3=5564
 He³, 0.02°-0.3°K, rel. to melting curve 3=14437
 He³, solid, α and β -phases meas. 3=1887
 He⁴, solid, rel. to equil. with liq. He⁴ II 3=1888
 Hf, HfO₂, Debye temps. 3=12568
 Hf, 1.1°-4.5°K 3=15437
 Hg amalgams, Debye charact. temp. 3=16604
 Hg₂SO₄, 15°-300°K, meas. 3=6477
 Ho, 0.38-4.2°K 3=2730
 Ho₂O₃, lattice and electronic contribs. 3=20106
 In, lattice, below 1°K, calc. from vib. spectrum 3=8348
 InAs, Debye temp., neutron scatt. data 3=25201
 InAs, InP, InSb, atomic 12-273°K 3=12928
 InSb, Debye temp., neutron scatt. data 3=25201
 InSb, 20° to 660°C 3=22661
 K, calc. by Toya's method 3=10599
 KBr, spectroscopic meas. 3=12926
 K₂CO₃, solid and molten 3=22663
 KCl, Grüneisen const., Born's theory 3=25203
 KMnF₃, 78-300°K, and antiferromagnetic and crystal structure transitions 3=8365
 KPF₆, rel. to first-order phase transition 3=12927
 Kr 3=16659
 La₂O₃, 5°-350°K meas., Schottky anomaly 3=20104
 Li, three models 3=12914
 Li₂CO₃, solid and molten 3=22663
 LiCuCl₂·2H₂O, rel. to Néel temp. 3=1205
 LiF, contrib. of F₂⁻ centres, calc. 3=15439
 LiF, quantum-mech. box model 3=4796
 Lu, Lu₂O₃, Debye temps. 3=12568
 Mg, const. vol., from lattice vibr. spectrum 3=10578
 MgO, 298°-1200°K 3=25196
 MnCl₂, liq. He temps., rel. to mag. transitions 3=2731
 MnCO₃, magnetic and other contribs. 3=3145

Specific heat—contd

- MnCO₃, 1.6° to 70°K, rel. to antiferromagnetic transition 3=17659
- Mn—Cu alloys, rel. to temperature, theory 3=8358
- Mn—Fe solid solutions, electronic 3=8367
- Mn_xFe_{1-x}O₄ ferrite, 1.5–6°K anomaly 3=15435
- Mn—Ni solid solutions, electronic 3=8367
- Mo, Debye temp. from elastic constants 3=13325
- Mo, 0–2400°K 3=20102
- Mo, 1200°–2400°K 3=10596
- Mo, electronic, coefficient 3=3959
- MoS₂, Debye temp. 3=8376
- N₂, from acoustic velocity 3=16659
- N₂, ratio, rel. to pressure 3=1728
- (NH₄)₂BeF₄, near ferroelec. transition pt. 3=17941
- NH₄HSO₄, anomaly at –2.55°K due to ferroelec. trans-form. 3=20101
- NH₄PF₆, rel. to phase transitions 3=12927
- NO vapour, saturated 3=11833
- N₂, β-quinol clathrate, 15°–100°K, and N₂ motion 3=8284
- Na, calc. 3=6476
- Na, calc. by Toya's method 3=10599
- Na, 5°K, annealing effect 3=8445
- Na vapour, and heat of vaporization, inconsistency 3=21444
- Na₂CO₃, solid and molten 3=22663
- NaCl, and frequency distribution 3=25188
- NaCl, Grüneisen const., from eqn. of state 3=25205
- NaCl, Grüneisen constant at high pressures 3=4827
- NaCl, quantum-mech. box model 3=4796
- NaOH and monohydrate 3=7388
- Nb, 1200°–2400°K 3=10596
- Nb—Ru alloys, electronic, and Debye temp. 3=22662
- Nd₂O₃, 5°–350°K meas., Schottky anomaly 3=20104
- Ni, characteristic temperature, 20°–600°K 3=17661
- Ni, 99.95% pure 3=8359
- Ni, Ni—Cu, electronic sp. ht., temp. depend. 3=23143
- Ni, sp. ht. —temp. curves 3=13244
- NiAl, 4.2°–2.2°K meas. 3=23270
- NiCO₃, 1.6° to 70°K, rel. to antiferromagnetic transition 3=17659
- Ni₃Fe—(3%)Mo, rel. to K-state formation, rel. to excess vacancies 3=13531
- Ni₃Pt, characteristic temp., effect of short-range order and annealing 3=8906
- Pb, 0.3°–4°K 3=10601
- Pb(99%)—Bi alloy, electronic 3=6478
- Pd, electronic contrib. at high temps. 3=10600
- Pd, Pd—Ag, Pd—Rh, electronic sp. ht., mag. susceptibility 3=13228
- Pd and Pd—H alloys, 30–300°K 3=12924
- RbPF₄, rel. to order—disorder changes 3=12927
- S, liquid, containing P, Se or Te 3=5430
- SF₆, 100° to 1500°K 3=21445
- SOF₂, 100° to 1500°K 3=21445
- Sb, 20–700°K 3=22659
- Se, low temp., calc. 3=8362
- Si, Grüneisen parameters 23°–530°K 3=4824
- SiO₂ glass, low-temp. excess 3=767
- Sm₂O₃, 10°–350°K, electron and lattice contribs. 3=20105
- Sn, grey and white, interreln. 3=11209
- SrTiO₃ 3=2957
- Ta, Debye temp. from elastic consts. 3=13325
- Ta, 1200°–2400°K 3=10596
- Tb, 0.37–4.2°K 3=771
- Te, low temp., calc. 3=8362
- α-Ti, anomalous, rel. to thermal electron transitions 3=20127
- Ti, 1.1–4.5°K 3=15437
- Ti, 600–1345°K 3=22660
- Ti—V solid solutions, electronic 3=8367
- Ti, V—Ti, electronic sp. ht. 3=25509
- Tl(1%)—Pb(98%)—Bi alloy 3=6478
- U dicarbide, 1484° to 2581°K 3=15438
- V, three models 3=12914
- V, V—(Cr, Ti), electronic sp. ht. 3=25509
- V—Cr solid solutions, electronic 3=8367
- V—Ni solid solutions, electronic 3=8367
- W, Debye temp. from elastic constants 3=13325
- W, 1200°–2400°K 3=10596

Specific heat — contd

- Y ethylsulphate 3=4799
- YH₃ and YD₃ 3=17658
- Yb, 0.4°–4°K, meas. and theory 3=8368
- Yb₂O₃, 10°–350°K, electron and lattice contribs. 3=20105
- Zn, electronic, first principles calc. 3=8395
- Zr alloys, dilute, 1.2°–4.5°K 3=25199
- Zr, 1.1–4.5°K 3=15437

Spectra

- See also Absorption, light; Astronomical spectra; Atmospheric spectra; Colour; Mass spectra; Raman spectra; Spectrochemical analysis; Spectroscopy; Stark effect; X-ray spectra; Zeeman effect.
- adsorbed molecules, i.r. and Raman 3=5152
- crystals, quasi-line electron-vibrational spectra, Shpol'skii effect 3=20456
- diatomic molecules, higher-order spectroscopic parameters, empirical potl. func. 3=22524
- distance bet. spectrum lines, precise meas. 3=1814
- elec. discharges, "slant" effect in axial mag. field 3=19200
- excitation by ion bombardment, review 3=9594
- excitation by shock waves, review 3=11912
- far u.v. intensity and wavelength, absolute measurement 3=9591
- gas pressure broadening, as relax. process 3=16663
- gases, i.r. bands. integr. intensity and line widths, meas. method 3=7248
- gases, line broadening mechanisms and profile meas. 3=14340
- gases, transparency, population shift theory 3=16662
- hydrated electron, absorption spectrum 3=6926
- i.r. absorpt. rel. to atomic polarization 3=12809
- i.r., and molecular structure 3=15316
- i.r. internally reflected appl. to surface study 3=18597
- inert gases, i.r. using stimulated emission 3=9507
- ions, impurity in plasma torus TA 2000, far u.v. emission 3=5680
- line broadening by collision, general theory 3=3877
- molecular, photoelec. meas. on discharge, theory 3=2620
- molecular solids, i.r. lattice combination bands 3=4969
- molecule in condensed medium, effect of effective field 3=19958
- molecules, i.r., band shape calc., overlapping rotational lines 3=17554
- molecules, polyatomic, absorpt., i.r., review 3=15323
- molecules, Raman rel. to electronic absorption 3=15319
- molecules, spin-degenerate, vibrational spectra and Jahn—Teller effect 3=717
- molecules, universal reln. to fluoresc., rel. to excited states 3=15320
- plasma, from Ti gun with hydrogenated electrodes 3=7519
- plasma, H_ν Balmer line Stark broadening 3=4108
- plasma in Zeta, 0.1–2.0 mm wavelength 3=7594
- plasma, line self-absorption, extension of limits of applicability 3=19282
- plasma, mag. compressed, vacuum u.v. 3=7505
- plasmas, high temp. collision-dominated 3=7506
- positronium, Lyman α line, det. attempt 3=7839
- pressure-induced shifts of i.r. lines due to polar molecules 3=8227
- random matrix diagonalization, numerical calc. 3=21201
- Shannon approx., calc. of true shape of spectra 3=3878
- singlet-triplet transitions in magnetic rotation spectra 3=2594
- solids, narrow-line electronic, thermal broadening 3=2697
- solids, phonon broadening of impurity lines 3=20457
- solutions, electron spectra of solute, effect of internal field 3=21373
- Ar lamps, 230–1200 μ, effect of structure and excitation 3=16760
- H₂ plasma, energy emitted at equilibrium 3=19232
- H₂O vapour, total absorptance in near i.r. 3=23933
- I, adsorbed, diffuse reflection 3=13574
- I, excitation in hollow discharge 3=17527
- Kr lamps, 230–1200 μ, effect of structure and excitation 3=16760
- Kr, 600–886 Å absorption coeffs. 3=23934
- N₂O, total absorptance near 4.5 μ 3=14217

Spectra — contd

- O arc plasma, Stark-broadening, shifts and widths 3=24277
- O—H bond, absorpt. band, effect of ions 3=8285
- TiCl₄—Ar mixtures, neutral Ti emission behind reflected shock waves 3=11836
- Xe lamps, 230-1200 μ , effect of structure and excitation 3=16760

continuous

- Ar, vacuum u.v. 3=7462
- Ar, vacuum u.v. meas. 3=7246
- Cs atom, continuous emission spectra and series limits 3=25050
- Ca, 4^3P — n^3D and 3^3D — n^3F limit 3=12758
- Cs, emission and series limits 3=25050
- He, vacuum u.v. 3=7462
- He, vacuum u.v., meas. and origin 3=7246
- Hg, emission and series limits 3=25050
- Kr, behind shock wave 3=14218
- O, free—free continuum, rel. to polarization and exchange 3=17531
- W, spark, emission, spatial distribution, apparatus 3=24249
- W, spectral power distrib. from colour temp. 3=7322
- Xe, absorption, energy distrib. 3=17535
- Xe, behind shock wave 3=14218
- Xe, vacuum u.v. 3=7462
- Xe, vacuum u.v. meas. 3=7246

flames

- acetylene, reaction zone, atomic spectra excitation of 25 elements 3=19925
- alkali metals, detection and abundance 3=8990
- flame mechanism and atomic absorption spectroscopy 3=699
- of metal powder—oxygen flames 3=10504
- methyl alcohol—air, OH bands and rotational temperature 3=12830
- molecule and radical excitation, review 3=10483
- Al—oxygen flame 3=10504
- CO, flame bands 3=25091
- Mg—oxygen flame 3=10504
- SnCl₄ reactions, fluted bands 3=20990

resonance

- See also Luminescence.
- plasma, Doppler-broadened lines, radiative transfer 3=9813
- CdS, optical absorption, 4-2°K, and excitons 3=8594
- Hg, 2537 Å line, broadening in inert gases 3=706

atoms

- See also Atoms, excitation; Atoms, structure
- absorption and configuration interaction effects 3=10439
- absorpt., for spectrochemical analysis, use of Beer—Lambert law to improve cells 3=23556
- absorption spectroscopy and flame mechanism 3=699
- actinide elements, 1st and 2nd spectra 3=18998
- alkali metals in flames, detection and abundance 3=8990
- analytical curves rel. to line profiles in absorption 3=18465
- atomic beam resonance method 3=2
- autoionizing level, reduced width, R-matrix theory 3=25037
- broadening effect of several atoms, theory 3=15273
- conference, Gor'ku, 1961 3=18981
- double resonance expt., modulation of light 3=22474
- excitation by low-voltage discharge 3=24230
- forbidden emission lines, intensity 3=2550
- gas mixture, stimulated emission 3=5465
- gf values for 70 elements 3=2551
- h.f.s. calc., light atoms 3=15288
- heavy elements in plasma, Stark broadening of isolated lines 3=701
- heavy elements, X-ray L intensities, 50 kV electron excitation 3=8178
- inert gas—proton collisions, Lyman α production 3=16910
- inert gases, energy losses, resolution by optical emission analyser 3=21880
- inert gases, u.v. absorpt. 3=13179
- ionized, multiple, discharge, vacuum, low voltage, atlas 3=25035
- i.r. emission, extraphotographic obs. 3=18983

Spectra—contd

atoms—contd

- irregular doublet law, rel. to screening consts. theory 3=25039
- isotopic shift 3=25040
- isotope shift, second-order contribs. 3=8216
- lanthanide elements, 1st and 2nd spectra 3=18998
- lifetimes, mean, polarimetric meas. 3=15287
- line half-width, broadened by electron impact, calculation 3=8174
- line identification list below 2000 Å for 10 elements 3=21538
- metals, in halide flames, var. with active N 3=22605
- multiply-ionized, by sliding and triggered vacuum spark techniques 3=9593
- non-hydrogenic system, continuous absorption coeffs. 3=3599
- nuclear and relativistic effects 3=12752
- oscillator, strengths, absolute scale 3=22470
- oscillator strengths calcs. using Coulomb approx. 3=2548
- plasma, two types of atoms 3=9812
- plasmas, high-density corrections 3=1961
- rare earth, arc, atlas. 3=25854
- rare earths, doubly and triply ionized 3=19947
- rare-earths, 1st and 2nd spectra 3=19946
- review of line spectra from outer electrons 3=19916
- screening doublets and X-ray satellites 3=10443
- self-absorption of lines rel. to total intensities 3=10440
- spacing distrib., next-nearest neighbour energy levels 3=7978
- spectrophotometer, atomic absorption 3=24025
- statistics of radiative transition probabilities 3=4700
- transition probabs. calc. for 70 elements 3=19917
- 25 elements, excitation in acetylene flame reaction zone 3=19925
- vacuum u.v. radiation physics, conference 3=5515
- from Van de Graaff beam passed through C foil and imaged on Raman spectrograph 3=19918
- wavelength measurement, using photoelectric scanner and Moiré fringes 3=698
- X-ray satellites, origin, survey 3=10442-3
- Zeta discharge, impurity u.v. line radiation, temporal variation 3=7463
- Al, oscillator strengths of 15 lines 3=15279
- Al I, term system recalculated 3=8179
- Al I 3962 Å line intensity rel. to press., in arc. 3=24250
- Al III, doublets, fine structure 3=10446
- Al VII, in spark discharge 3=11921
- Ar, emission in high pressure arc plasma 3=8180
- Ar, absorption coeff., continuous, 4000-7000 Å, 8000-24 000 Å 3=1972
- Ar, absorption, 600-1025 Å 3=25056
- Ar cascade arc, vacuum-u.v. intensity definition 3=4076
- Ar ions, forbidden transition probabs. calc. 3=25055
- Ar ions in vacuum C arc 3=19330
- Ar, in plasma, Stark broadening 3=701
- Ar, transition probabilities 3=19943
- Ar, two-electron transitions to autoionizing states 3=1992
- Ar I, absolute oscillator strengths 3=15280
- Ar I and II, resonance lines 3=14355
- Ar I and II, transition probabs. meas. 3=10447
- Ar II 3=4217
- Ar II in low press. plasma, excited by electron beams 3=7609
- Ar II and III in plasma wrapped round Cu vapour 3=7557
- Au, new L transition, non-quadrupole 3=8183
- B, highly ionized, in high-temp. plasma 3=10448
- B²⁺, isotope shift, open-shell calc. 3=10456
- B¹¹, ²P_{3/2}, ²P_{1/2} states, h.f.s., calc. 3=15288
- Ba I, isotope shifts in resonance line 3=22477
- Ba II, resonance doublet shift and broadening rel. to He and A colls. 3=2562
- Be I, 2050-18 200 Å 3=2563
- Br⁺, gaseous ions, absorption 3=2565
- C, arc, visible and i.r., as radiation standard 3=21539
- C, highly ionized, in high-temp. plasma 3=10448
- C, oscillator strengths of certain lines 3=25048
- C, use as standards in vacuum u.v. 3=13989
- C⁻, photodetachment 3=4003
- CI, transition probabilities 3=702

Spectra—contd
atoms—contd

- C I and II, intensity ratio, rel. to hydrocarbon arc temp. 3=7484
 Ca, 4^3P-n^3D and 3^3D-n^3F limit continua 3=12758
 Ca XIII, $^3P_1-^3P_2$ transition, 4086.3 Å coronal line 3=17522
 CaI, $4s4p^3P_1$ term, g_J factor meas. 3=2564
 Ca I 4227 Å oscillator strength, by absorption in atomic beam 3=19932
 Cd, emission, 1.6-3.7 μ 3=15281
 Cd^{107, 9, 11, 13}, 3S , h.f.s. and isotope shifts 3=25049
 Cd¹⁰⁹, (5s5p) 3P_1 state, Zeeman effect and h.f.s. 3=19931
 Cd¹¹⁴ vacuum wavelengths 3=12763
 Ce I, low energy levels 3=19933
 Ce³⁺, in alkaline earth fluoride crystals 3=25452
 Ce⁴⁺, in Ce : LaAl₂, Stark splitting 3=20071
 Cl ions, forbidden transition probabs. calc. 3=25055
 Cl⁻, gaseous ions, absorption 3=2565
 Cl I and II, transition probabilities 3=702
 Cm²⁴, in La ethylsulphate and LaCl₃, e.s.r. 3=13289
 Co II, relative oscillator strengths 3=8181
 Cr I emission from shock tube 3=8182
 Cs, absorption in hydrocarbon vapours 3=22478
 Cs, continuous emission and series limits 3=25050
 Cs, i.r. emission 3=12756
 Cs, in plasma, Stark broadening 3=701
 Cs¹³³ I, $8^3P_{3/2}$ term, h.f.s. and lifetime 3=10451
 Cs¹³³, $8^3P_{3/2}$ state, h.f.s. 3=12757
 Cu, in low-temp. flame, using new spark source 3=11923
 Cu with Zn, in discharge, effect of Si, Na, time var. 3=25845
 Cu I 5782 and 5292 Å line intensity rel. to press., in arc. 3=24250
 Cu I, line intensities and g_f values 3=6352
 Cu I, II 3=4217
 Cu XIII, $^3P_{3/2}-^4P_{1/2}$ transition, 3454.3 Å coronal line 3=17522
 D, Lamb shift of ground state 3=7328
 Dy, isotope effect meas. 3=15282
 Er II, energy levels 3=10453
 F⁻, gaseous ion, absorption 3=12759
 F¹⁹, $^3P_{1/2}$, $^2P_{1/2}$ states, h.f.s., calc. 3=15288
 Fe, line blackening in hollow cathode 3=19936
 Fe I 3175 Å line intensity rel. to press., in arc. 3=24250
 Fe III, nonlinear effects in theory 3=8185
 Ga, oscillator strengths of 13 lines 3=15279
 Gd⁺⁺⁺ absorption bands, oscillator strengths 3=19935
 Gd²⁺ 3=12761
 Ge, use as standards in vacuum u.v. 3=13989
 H, Balmer emissions, by proton impact on H₂ 3=15278
 H, Balmer emissions due to H₂⁺ and H₃⁺-H₂ collisions 3=25043
 H, Balmer lines, Stark broadening 3=19926
 H β broadening, rel. to hydrocarbon arc temp. 3=7484
 H, discontinuities, mean optical depth of formation and series limit line strength 3=25041
 H α , γ , in plasma jet, line shape 3=2000
 H, line blackening in hollow cathode 3=19936
 H line broadening of plasma in arc and shock tube 3=18861
 H lines, Stark-broadened, wing formulae 3=2558
 H Ly α , on quenching 3=4717
 H, Lyman- α , prod. by ion-atom collisions 3=6366
 H, plasma, line asymmetry 3=12753
 H, Stark-broadened Belmer line profiles 3=8176
 H, 256-1216 Å 3=14355
 H, Zeeman transition frequ. in geomag. field 3=8190
 H⁻, photodetachment 3=4003
 He, electron excited, lines polarization 3=2581
 He, emission, 1.6-3.7 μ 3=15281
 He, in e.m. driven compression shocks 3=1752
 He, i.r., in sunlit upper atmos. 3=16282
 He ions in vacuum C arc 3=19930
 He, line blackening in hollow cathode 3=19936
 He, Lyman- α , prod. by ion-atom collisions 3=6366
 He⁴, Lamb shift of ground state 3=7328
 He⁴, Lamb shift of ground state 3=7328
 He⁷, Lamb shift of first excited state 3=7828
 He-Ne mixture, laser effect transitions 3=22475
 He I and II in pinch discharge 3=7559

Spectra—contd
atoms—contd

- He I and II, resonance lines 3=14355
 HeI and HeII, transitions due to proton excitation 3=2560
 HeI, HeII, intensity ratio 3=12142
 HeII in low-press. plasma, excited by electron beams 3=7609
 He II line broadening, exptl. contrib. to theory 3=4069
 He, two-electron transitions to autoionizing states 3=19927
 He, two-electron transitions to autoionizing states 3=19928
 Hf III, Slater parameters 3=703
 Hf III, Zeeman effect 3=22480
 Hg, continuous emission and series limits 3=25050
 Hg, 4561 Å line-shape in arc, detm. 3=7578
 Hg in-discharge lamps, line intensity ratios, 1 to 400 torr. 3=255
 Hg, line blackening in hollow cathode 3=19936
 Hg, magnetic dipole radiation 3=25059
 Hg, rare-gas, resonance radiation, radial and total intensities 3=12764
 Hg, resonance radiation in discharge, quenching 3=19938
 Hg, 7^3S , state, mean lifetime meas. 3=15287
 Hg, trapped in isopentane and Ar matrices, absorption, 1650 to 2600 Å, 20°K 3=17528
 Hg, 2537 Å line, hyperfine structure 3=25054
 Hg, 2537, 4077, 4358, 5461 lines in Hg-Ar discharge 3=24236
 Hg, 2537 Å, isotope shift 3=22484
 Hg, use as standards in vacuum u.v. 3=13989
 Hg II, III in low press. plasma, excited by electron beams 3=7609
 HgII, Zeeman effect and g -values 3=15286
 Hg^{193m, 194, 195, 195m}, h.f.s., isotope and isomer shifts 3=17530
 Hg^{194, 195, 195m}, h.f.s. and isotope shifts 3=17529
 Hg¹⁹⁸ vacuum wavelengths 3=12763
 HgI, Zeeman effect and g -values 3=15286
 Ho in ethyl sulphate, h.f.s. splitting 3=10572
 I, line blackening in hollow cathode 3=19936
 I⁻, gaseous ions, absorption 3=2565
 In, oscillator strengths of 26 lines 3=15279
 K, arc lines, excitation cross-section 3=17533
 K, oscillator strengths KI($4^2S_{1/2}-4^2P^0_{1/2,3/2}$) doublet 3=17532
 Kr, autoionization lines 600-886 Å 3=23934
 Kr, continuous, behind shock wave 3=14218
 Kr gas discharges, Stark effect broadening 3=4751
 Kr, transition probabilities 3=19943
 Kr II, line broadening in plasma 3=10454
 Kr⁸⁶ vacuum wavelengths 3=12763
 Li, isotope shift, open-shell calc. 3=10456
 Li I 6103 Å line intensity rel. to press., in arc 3=24250
 Li, 2P state, "anticrossing" 3=17526
 Li⁺, Lamb shift of first excited state 3=7328
 Li⁺, $1s2s^4S-1s2p^3P$ transition 3=2569
 Lu I, Zeeman effect analysis 3=22481
 Lu II, Zeeman effect data 3=22482
 Mg, in acetylene flame, reaction zone study 3=23543
 Mg, 2852 Å line, short-wavelength wing interpret. 3=15285
 Mn II 3=19948
 Mo III 3=19948
 N, from Van de Graaff beam passed through C foil and imaged on Raman spectrograph 3=19918
 N, highly ionized, in high-temp. plasma 3=10448
 N ions in vacuum C arc 3=19330
 N, oscillator strength, Hartree-Fock calc. 3=4708
 N, oscillator strengths of certain lines 3=25048
 N, pink afterglow, excitation mechanism 3=22486
 N, pink afterglow, u.v. component 3=22485
 N, use as standards in vacuum u.v. 3=13989
 NII lines, from lightning 3=11415
 N II and III in plasma wrapped round Cu vapour 3=7557
 N IV in plasma, rel. to ion collective motion 3=24304
 N V, Rydberg series 3=19939
 N⁴, h.f.s., pressure shift, 7-87 torr 3=19941
 N⁴, $^4S_{3/2}$ state, h.f.s., calc. 3=15288
 Na, glow discharge, level population inversion 3=8177
 Na, line blackening in hollow cathode 3=19936
 Na, optical excitation function meas. 3=10469
 Na, $3^3P_{3/2}$ state, mean lifetime meas. 3=15287
 Ne, highly ionized, in high-temp. plasma 3=10448

Spectra — contd

atoms — contd

- Ne, 1.15 μ 2p_{1/2} \leftarrow 2s_{1/2} transition, isotope shift and saturation behaviour 3=19944
- Ne, transition probabilities 3=19943
- Ne, two-electron transitions to autoionizing states 3=19927
- Ne, use as standards in vacuum u.v. 3=13989
- NeI lines, precise meas. of separation 3=1814
- Ne I and II, resonance lines 3=14355
- Ne II 3=4217
- Ne II in low-press. plasma, excited by electron beams 3=7609
- Ne II, line broadening in plasma 3=10454
- Ne IV, V, VI, new lines, 2200-3000 Å 3=10459
- Ni I 3002 Å line intensity rel. to press., in arc. 3=24250
- Ni II 3=19948
- Ni II, relative osc. strengths 3=10460
- O, airglow, synthetic 3=6989
- O, highly ionized, in high-temp. plasma 3=10448
- O I, quintet, triplet terms, below ionization limit 3=22487
- O⁺, photodetachment 3=4003
- O²⁺, ³P₂ ground state, h.f.s. splitting 3=19945
- O²⁺, ³P₂, ¹P₁ states, h.f.s., calc. 3=15288
- Os, radiative transition probabilities 3=4700
- P ions, forbidden transition probabs. calc. 3=25055
- Pb resonance line, impurity broadening 3=2568
- Pb, L-spectra, quadrupole and forbidden transitions 3=4712
- Pd III, spectrum and levels 3=12765
- Pm¹⁴⁷, hyperfine structure, high resolution 3=10463
- Pr III, energy level analysis 3=15291
- Pu, arc spectrum, ground-state multiplet 3=6354
- Pu, hyperfine and isotopic structure 3=15290
- Pu I, hyperfine structure 3=10461
- Pu II, hyperfine structure 3=10462
- Pu²³⁹ h.f.s. 3900 to 6900 Å 3=15289
- Pu^{239,241}, h.f.s., and nucleus, mag. moment 3=17392
- Rb, pressure effects, Ar 3=22488
- Rb⁸⁷, Zeeman transition frequ. in geomag. field 3=8190
- Re, L-spectra, quadrupole and forbidden transitions 3=4712
- Re⁷⁵, L-emission, quadrupole and forbidden lines 3=15293
- Rh III 3=19948
- S ions, forbidden transition probabs. calc. 3=25055
- S⁺, photodetachment 3=4003
- Sb I 3029 Å line intensity rel. to press., in arc. 3=24250
- Si IV, doublets, fine structure 3=10446
- Sm, isotope shift 3=15294
- Sn I 3009 Å line intensity rel. to press., in arc. 3=24250
- TeI, f-values 3=17534
- Tm, arc, ionization potential 3=8193
- V II 3=19948
- V III, 500-8600 Å meas. 3=8195
- V²⁺, in octahedral coord. crystal 3=12768
- W, L-spectra, quadrupole and forbidden transitions 3=4712
- Xe, absorption, 600-1025 Å 3=25056
- Xe, continuous, behind shock wave 3=14218
- Yb I, isotope shift in λ 5556 Å 3=8196
- Yb¹⁷³, h.f.s., nuclear quadrupole moment 3=2364
- Zn with Cu, in discharge, effect of Si, Na, time var. 3=25845
- Zn I 4680 Å line intensity rel. to press., in arc. 3=24250
- Zn II, u.v. lines, isotope shift 3=19949
- Zn VIII triplet at 160 Å 3=9593

inorganic molecules

See also Molecules.

- anomalous props. rel. to Jahn-Teller effect 3=19957
- centrifugal distortion effects in asymm. rotator 3=2595
- condensed medium, correcting for universal effective field 3=25077
- Elsasser band, transmissivity 3=15322
- i.r. adsorbed layers 3=21285
- i.r., solvent effects 3=22521
- linear, effect of vibr.-rot. interaction 3=8232
- pressure-induced shifts of i.r. lines, theory 3=17607
- simple, theoretical computations 3=10500
- symmetric-top, unresolved bands, mol. consts. det. 3=10482
- vacuum u.v. radiation physics, conference 3=5515

inorganic molecules, diatomic

- air, radiant emissivity at high temps. 3=1732
- infrared, inert gas pressure effects, theory 3=25078

Spectra—contd

inorganic molecules, diatomic—contd

- intensities of electronic transitions 3=15335
- Σ terms, multiplet, anomalous splitting 3=12796
- spectral absorpt. coeffs. for electronic band systems 3=2606
- unresolved bands, mol. consts. det. 3=10482
- vibration-rotation bands, pressure broadening meas. 3=9510
- AgF, near u.v. 3=12832
- AgSe, absorption, three band systems 3=10524
- AgTe, absorption, three band systems 3=10524
- AlAu, emission and absorption 3=10505
- AlO, bands, visible 3=25089
- AlO, from metal-oxygen flame 3=10504
- AuBa, AuCa, AuSr, vibrational analysis 3=19979
- AuTe, emission 3=12819
- BF, BCl, attributed to CCl⁺ and CF⁺ 3=8252
- BiBr, emission, A \rightarrow X system analysis 3=6389
- C₂, A' $^2\Sigma^-X'$ $^1\Pi_u$ system, analysis 3=8250
- C₂, band head intensities, rel. to hydrocarbon arc temp. 3=7484
- C₂, Phillips system extension 3=8251
- C₂, Swan bands 3=19975
- CBr radical, near 3000 Å 3=25092
- CCl⁺ and CF⁺, really due to BF and BCl 3=8252
- CF, absorpt., pre-dissociation, from fluorocarbon discharge 3=15345
- CH 3=7328
- CN, chem. and mag. enhancement of violet lines 3=8253
- CN red system, (2.0) and (3.1) bands 3=21107
- CN, red system, vibr.-rotational theory 3=2611
- CN, u.v., emission, intensity rel. to microwave absorption 3=6390
- CN, violet system 0-0 band, variation with temp. 3=11344
- CO, adsorbed on chromia-alumina and on Al 3=3359
- CO, dense forms, 1-0, 2-0, 3-0 bands 3=17572
- CO, emission, excited by protons and H atoms 3=15338
- CO, gas, radiation, shock wave heated 3=11835
- CO, i.r. emission from Hg* \rightarrow CO electronic-vibrational transfer 3=10506
- CO, line-strengths in 2-0 band 3=4744
- CO, pure rotational absorption lines 3=24019
- CO, rotational line broadening by HCl and Ar 3=12817
- CO 3=7328
- CO, 2v and 3v bands, self-broadening 3=19978
- CO, vibr.-rot. bands, pressure broadening 3=9510
- CO, vibrational intensity distribution 3=10503
- CO⁺, Franck-Condon factors and r-centroids 3=4743
- CO⁺, vibrational intensity distribution 3=10503
- CdD, u.v. band system obs. 3=2612
- CdH, u.v. band system obs. 3=2612
- Cl₂⁺, absorpt. bands, 4780-6000 Å 3=19976
- CoBr, λ 4300 - λ 4700 Å 3=12818
- CuTe, emission 3=12819
- D₂, heterogeneous perturbations between B¹ $\Sigma_u^+(2p)$ and C¹ $\Pi_u(2p)$ states 3=2613
- D₂, C¹ $\Pi_u(2p)$ state Λ doubling, isotopic effect 3=2614
- DCI³⁵, band lines, foreign gas effects 3=7244
- DCI, vibr.-rot. bands, pressure broadening 3=9510
- GaO, emission, vibr. and rot. analysis 3=25093
- H₂, emission, excited by protons and H atoms 3=15336
- H₂, ground state constants 3=8254
- H₂, heterogeneous perturbations between B¹ $\Sigma_u^+(2p)$ and C¹ $\Pi_u(2p)$ states 3=2613
- H₂, in overtone region, pressure-induced absorption 3=9512
- H₂, i.r. 1-0 band, quadrupole 3=248
- H₂, quadrupole bands 1-0, 2-0, 4000-5000 cm⁻¹ 3=17576
- H₂ 3=7328
- H₂, u.v., excited by electron swarm 3=10515
- H₂, C¹ $\Pi_u(2p)$ state Λ doubling, isotopic effect 3=2614
- HBr⁷⁸, band lines, foreign gas effects 3=7244
- HBr, i.r. Q-branch fundamental bands 3=248
- HBr-rare-gas mixtures, absorption under pressure 3=4747
- HCl³⁵, band lines, foreign gas effects 3=7244
- HCl, i.r. Q-branch fundamental bands 3=248
- HCl overtone lines, self-broadened, widths 3=4748
- HCl, pressure-induced shifts of i.r. lines 3=17607

Spectra—contd

inorganic molecules, diatomic—contd

- HCl, pressure induced shifts of i.r. lines due to polar molecules 3=8227
 HCl, pressure shifts by noble gases, theory 3=11837
 HCl, pressure shifts caused by noble gases 3=12820
 HCl, pure rot. linewidths, perturbed by rare gases 3=22542
 HCl-rare-gas mixtures, absorption under pressure 3=4747
 HCl¹⁷, i.r. absorption bands, dispersion 3=14345
 HD, heterogeneous perturbations between B¹Σ⁺_g(2p) and C¹Π_g(2p) states 3=2613
 HD, C¹Π_g(2p) state A doubling, isotopic effect 3=2614
 HF, fund. absorption band line shifts and broadening, rel to H₂ and D₂ at 150 kg cm⁻² 3=19984
 HF, Stark effect and hyperfine structure 3=6377
 H halides, vibr.-rot. lines, pressure effects 3=19983
 HI, ν₀₋₃ band, vib.-rot. lines 3=25097
 HI, fundamental and overtone lines 3=25097
 HI, line strengths and widths 3=4749
 H I, 1.2-3μ 3=24023
 HO, adsorbed by SiO₂, var. 3=8922
 He₂, molecular continuum 3=14355
 HeNe⁺, emission?, liquid air cooled hollow cathode lamp 3=12822
 Hg^{199,201}H, A¹H-X²Σ⁺ system, h.f.s. 3=6393
 HgH, multiplet splitting of X²Σ⁺ term 3=6388
 Kr₂ and Kr₂⁺, discharge obs. 3=4751
 LiCl, i.r., by matrix isolation method 3=22544
 LiF, i.r., by matrix isolation method 3=22544
 LiF, i.r., in solid Ar, Kr and Xe matrices 3=8261
 MgH and MgD, u.v. absorpt. bands analysis 3=25100
 MgO, from metal-oxygen flame 3=10504
 MnH, multiplet splitting of Σ term 3=6388
 N₂, absorption coeff., 580-1000Å 3=25101
 N₂, absorption, vacuum u.v. 3=7329
 N₂, compressed, far i.r., rot., collision induced dipole moments 3=17580
 N₂, emission, excited by protons and H atoms 3=15338
 N₂, far u.v., high-dispersion absorption 3=10513
 N₂, first negative system, in He 3=2622
 N₂ gas, radiation, shock wave heated 3=11835
 N₂, Goldstein-Kaplan bands, structure 3=8262
 N₂, in high tension discharge 3=4762
 N₂, pink afterglow, u.v. component 3=22485
 N₂, pre-ionized absorption bands 3=14220
 N₂, r.f. excited jet, 3000-9000 Å 3=22545
 N₂, Rydberg absorpt. series, 600-1000 Å 3=4754
 N₂, second positive system, intensities 3=2620
 N₂, u.v., excited by electron swarm 3=10515
 N₂, vibrational intensity distribution 3=10503
 N₂⁺ 3=4755
 N₂⁺, first negative band intensity behind shock waves rel. to pres. 3=4756
 N₂⁺, use in auroral temp. meas. 3=9104
 N₂³⁺, 2nd positive system, Einstein A coeff., oscillator and abs. band strengths 3=22546
 N₂⁺, vibrational intensity distribution 3=10503
 N₂⁺, D²Π_g-A²Π_u band origin wave-numbers 3=22547
 N₂¹⁵ u.v., isotopic shifts, anomalous 3=25102
 N₂, A²Σ_g⁺ and B²Σ_g⁺ terms, splittings 3=6388
 ND radical, two new bands 3=12876
 NH radical, band system 3=12876
 NO, absolute intensity of 5μ fundamental 3=15339
 NO, absorption 3=10517
 NO band emission in shock heated air 3=3836
 NO, β, γ, δ, and Ogawa band excitation 3=8264
 NO, γ₀₀ band, use in temp. meas. 3=10516
 NO, γ-bands at 2000°K, absorpt. 3=2606
 NO, 1.2-3μ 3=24023
 NO, visible and i.r., Rydberg series 3=10518
 NO, (0, 0) and (1, 0) bands 3=19986
 NS, B²Π-X²Π system, vibr. analysis 3=12825
 NS, new Π-X²Π band system 3=12826
 NaF, i.r., by matrix isolation method 3=22544
 Na₂, second positive system, intensities, effect of He 3=2621
 Na₂, u.v., and electronic structure 3=22549
 NiBr, band heads, 4000 to 4500 Å 3=10512
 NiH, NiD, u.v. absorpt., analysis of bands 3=25103
 O₂, absorption lines, microwave frequency 3=22548

Spectra—contd

inorganic molecules, diatomic—contd

- O₂, emission, excited by protons and H atoms 3=15338
 O₂, from O + NO₂, kinetic, vibr. distrib. 3=25818
 O₂ gas, radiation, shock wave heated 3=11835
 O₂, Hopfield's emission bands 3=8267
 O₂, Schumann-Runge band system, transition moments, detm. 3=19987
 O₂, Schumann-Runge system, Franck-Condon factors 3=10521
 O₂, 6300-3000 Å absorption 3=6395
 O₂, vibrational intensity distribution 3=10503
 O₂⁺, first negative vibrational system 3=8266
 OD⁺ rotational band analysis 3=12829
 OHΣ⁺Π band system, and temperature measurement in shock tubes 3=7281
 PbO, PbTe, i.r. band system 3=22543
 PbS, absorption spectrum, rotational analysis 3=10511
 RbH, Franck-Condon factors and r-centroids 3=4757
 S₂, emission band system 3=12833
 S₂, B²Σ⁺-X²Σ⁺, perturbations 3=12831
 S₂, ground state, X²Σ_g⁺, triplet splitting 3=10525
 S₂, trapped at 20°K, vibration spectra 3=2624
 SO radical, absorption 3=2625
 SbBr, emission, vibrational analysis 3=22539
 ScF, electronic 3=17583
 Si₂, absorpt. spectrum 3=8268
 SiCl, 3220-2735 Å, B-X system 3=10522
 SiN, B²Σ⁺-X²Σ⁺ spectrum 3=8269
 SiO, intensity distrib. in forbidden ¹Σ⁺-³Π_r transition 3=10523
 SrD, near u.v. absorption bands 3=25106
 SrD, C²Σ⁺→X²Σ⁺ system 3=25107
 SrH, near u.v. absorption bands 2=25106
 TiH, four bands in 4200-4300Å region 3=8270
 XeN, visible 3=15341
 YO, multiplet splitting of B²Σ term 3=6388
- inorganic molecules, diatomic, radiofrequency**
 See also Nuclear magnetic resonance and relaxation; Paramagnetic resonance and relaxation.
 measurement, by paramag. reson. absorption, for radio-astronomy 3=19988
 AlF 3=19973
 BaO 3=17570
 Li⁶F¹⁹ 3=10510
 NS, Σ-X²Π system 3=10520
 N¹⁴S, N¹⁶S, β- and γ-band systems 3=10519
 O₂, microwave absorption, freq. rel. to pressure 3=23938
 SH, by paramagnetic reson. absorption, and radio-astronomy 3=19988
- inorganic molecules, polyatomic**
 air, emission, excited by protons and H atoms 3=15338
 alkali metaborate vapours, i.r., bond structure 3=25808
 alkali permanganates, decomposed 3=16161
 carbonyls, Group VI, phosphine-substit. 3=6397
 cyclo-silicates, i.r. band, calc. 3=13171
 difluoramine, i.r. 3=8275
 hexahalide complexes, 4d and 5d, charge-transfer states 3=19972
 i.r. band intensity and structure 3=25076
 i.r. overtones and combination tone intensities, general formula 3=10526
 Rydberg levels in O-containing mols. 3=15321
 transition metal ions, halide complexes 3=15354
 uranyl nitrate, absorption bands analysis 3=8282
 AlF₃, i.r. absorption, 1340-1424°K 3=22553
 B₂O₃, B₂O₅, BO₂, i.r. absorption in solid A matrices 3=8272
 BrCN, vibration-rotation 3=12834
 BrF₃, analysis 3=2631
 CF₄, absorpt., pre-dissociation, from fluorocarbon discharge 3=15345
 CO₂, absorpt. in far i.r., collision-induced 3=23932
 CO₂ adsorbed on chromia-alumina and Al 3=3359
 CO₂ in atmosphere, weak telluric band 3=9045
 CO₂ gas, radiation, shock wave heated 3=11835
 CO₂ gas, ν₄ fundamental at 1200°K, model 3=5467
 CO₂, emission, excited by protons and H atoms 3=15338
 CO₂, excited states in CO flames 3=25091
 CO₂, i.r. absorption lines, 5.3-4.6 μ 3=19991
 CO₂, i.r. band, excited by active N 3=25108
 CO₂, i.r. emissivity, 4.3 μ band 3=17584

Spectra—contd

inorganic molecules, polyatomic—contd

- CO₂, total absorbance in i.r. 3=14216
 CO₂, ν_3 , 4-3 μ absorption, 1200° to 2400°K 3=1731
 CO₂⁻ radical, trapped 3=6418
 C₂O₂, i.r. absorption in solid Ar matrix 3=10527
 C¹³O₂, i.r., rotational perturbations 3=6399-400
 CS₂, near u.v. absorption 3=11839
 ClNF₂, i.r. 3=17585
 Co(III) complexes, spin-forbidden/band 3=22557
 [Cu(CN)₄]³⁻ ions, 7600-61 000 cm⁻¹, calc. 3=19992
 DON¹⁴,¹⁸O, u.v. absorpt., rel. to isomerism 3=6403
 D₂O, absorption in 1220-1240 Å u.v. 3=8276
 Ge₂H₆ and Ge₃D₈ 3=2627
 HCN, pure rotational absorption lines 3=24019
 HON¹⁴,¹⁸O, u.v. absorpt., rel. to isomerism 3=6403
 HO₂, i.r. evidence 3=17586
 H₂O 3=7328
 H₂O, absorption in 1220-1240 Å u.v. 3=8276
 H₂O, emission, excited by protons and H atoms 3=15338
 H₂O, Landé factor 3=22562
 H₂O, pure rotational absorption lines 3=24019
 H₂O, rotation in solid Ar, i.r. evidence 3=2628
 H₂O vapour, absorpt. bands 125°-200°C 3=15348
 H₂O vapour, absorp. spectrum in far i.r. 3=24032
 H₂O vapour, strength of ν_2 vib. 3=15347
 H₂O₂: N₂ system, i.r., matrix isolation 3=15349
 H₂S 3=7328
 H₂S, i.r., rel. to internal rotation 3=6401
 IF₃, analysis 3=2631
 K₂IrCl₆ 3=4973
 KMg(Ni)F₃, mag. dipole character 3=19993
 K₂UO₂F₆, i.r., and U—O bond force const. 3=22575
 LiAlF₄, i.r. absorption, 1200°-1600°K 3=22553
 Li₂F₂, i.r. in solid Ar, Kr and Xe matrices 3=8261
 Mg(Ni)F₃, mag., dipole character, from pleochroism 3=19993
 N₂ + H₂, in high tension discharge 3=4762
 N¹⁴D₃, inversion line J = 6, K = 6, hyperfine structure 3=2633
 N₂H₄, in high tension discharge 3=4762
 NH₃: N₂ system, i.r. matrix-isolation 3=15346
 NH₃, emission, excited by protons and H atoms 3=15338
 NH₃, in high tension discharge 3=4762
 NO₂, emission, max. intensity freq., calc. 3=19994
 NH₃, i.r. and u.v. 3=2632
 N₂O, 1.2-3 μ 3=24023
 N₂O, pure rotational absorption lines 3=24019
 N₂O, assignment of 3.21 μ band 3=2666
 NH₃, J = 3, K = 3 line shape, rel. to pres. and microwave power, 23.86 Gc/s 3=3837
 NH₄H₂PO₄, i.r. absorpt. 3=15342
 N₂O, i.r. band, excited by active N 3=25108
 NO, radical, trapped 3=6418
 NaAlF₄, i.r. absorption, 1200°-1600°K 3=22553
 Nd chloride, in alcohol-water, absorption, temp. depend. 3=21374
 PH₃, phosphine, near u.v. absorption 3=19996
 ReF₆, rotl. Raman spectrum, Rayleigh scatt. depolarization 3=2623
 RhF₆, i.r., Jahn-Teller effect 3=12839
 RuF₆, i.r., Jahn-Teller effect 3=12839
 SO₂, collision broadening 3=17621
 SO₂, line broadening by N₂ 3=8279
 SO₂, rotation spectrum 13 000-25 500 Mc/s 3=4763
 SO₂, rotational spectrum 3=15353
 SO₂, rotation spectrum, 1st vib. state 3=12840
 TiN₄, absorption 3=19999
 Va—O compounds, i.r. absorpt., vibr., and structure 3=22574
 XeOF₄, infrared, rel. to Xe—O bond 3=17590

inorganic molecules, polyatomic, radiofrequency

See also Nuclear magnetic resonance and relaxation;
 Paramagnetic resonance and relaxation.

- cis-N₂F₂, microwave spectrum 3=25111
 difluoramine 3=8274
 hydrazine, internal motions 3=10509
 I-type doubling and resonance, interpret 3=19960
 CO₂ at 1200°K, rel. to gas effects 3=5467
 ClO₂ 3=6398

Spectra—contd

inorganic molecules, polyatomic, radiofrequency—contd

- F₂CO, microwave, rel. to vibr. states 3=12836
 F₂HC—CDHF, 7-25 kMc/s, Stark modulation 3=17593
 HC¹³N¹⁵, resonance at 3.5 mm 3=14767
 H₂S, absorpt. meas. 3=21984
 N¹⁴H₃, refractive index in microwave region 3=21362
 N¹⁴O¹⁸, vibr.—rot. bands at 4.5 μ 3=6404
 NSF, microwave 3=22563
 OF₂, spin—rotational hyperfine structure 3=19995
 OF₂ 3=8278
 SF₂Br, microwave rotational spectrum 3=22572
 SO₂, molecular interaction and linewidth 3=12841
 S³²,³³O₂, 25-27.5 Gc/s 3=15351
 S³⁴O₂, rot. spectrum in first vibr. excited state 3=15351

inorganic liquids and solutions

- alkali metals, absorption perturbations, rel. to absorbed H, 400°-500°C 3=5443
 i.r., solvent effects 3=22521
 measurement, using multiple attenuation total reflection, opaque 3=18989
 solutions, aq., pressure effects on charge-transfer and transition metal ion spectra 3=1690
 AgBr sols, Tyndall, higher order 3=13629
 AlCl₃ in SOCl₂, Raman, 0.11-0.73 mole per mole 3=14170
 CO, i.r. 3=1693
 CO, solns. in N₂ and air 3=17572
 Eu²⁺, 0.35 to 2.6 μ 3=9462
 Fe(CO)₅, i.r., low-frequency 3=23883
 Ge, reflectivity, rel. to carrier formulae 3=14167
 Ge₂H₆ and Ge₃D₈ 3=2627
 N₃⁻ in solution 3=21377
 Nd²⁺, 0.35 to 2.6 μ 3=9462
 NdCl₃ in alcohol—water soln., absorption, -87°C 3=1691
 NdCl₃ in alcohol—water solutions, absorption 3=18816
 NO in liquid Kr 3=15685
 O liquid, absorption bands rel. to pressure (to 7000 atm), temp. (78°-300°K) and density 3=1692
 Pr²⁺, 0.35 to 2.6 μ 3=9462
 Sm²⁺, 0.35 to 2.6 μ 3=9462

inorganic solids

- absorption edge, rel. to defect fields 3=13161
 alkali halide phosphors, explanation 3=23100
 alkali halides, Ag ions, oscillator strength 3=10965
 alkali halides, α and γ bands, exciton model 3=20467
 alkali halides, rel. to specific heat 3=754-65
 alkali-halides with U-centres, i.r. absorpt. 3=20247
 alkali halides, vac. u.v. 3=10964
 anthracene, meas. and exciton model 3=2970
 beryls, Fe-coloured, absorption, 290° to 1.7°K 3=3001
 calcium aluminates, hydrated, i.r., and H₂O behaviour 3=13165
 colour centres, LiF, line and band 3=6540
 crystal excitons, and photoconductivity, luminescence 3=22689
 crystal impurity centres, when Condon's approx. is not valid 3=20458
 crystals, additional light waves in exciton absorption region 3=10913
 crystals containing Fe²⁺, down to 1.7°K 3=15681
 crystals; exciton absorption in elec. fld., theory 3=10937
 crystals, perturbed exciton 3=10932
 crystals with rare-earth fons, absorption spectra 3=12350
 cubic diamond-type, derivation from structure theory 3=10618
 cuprite, green and yellow series as exciton spectra 3=25455
 diamond, i.r. absorption, rel. to lattice vibrations 3=10577
 diamond, i.r., review, Raman's work 3=23069
 diamond, type I, i.r. absorption 3=10928
 diamond, type IIb, absorption, optical phonon effects 3=10933
 diamonds, i.r., vibr. freqs. 3=18003
 diamonds, synthetic, types I and II 3=8595
 dichromates, electronic absorpt. spectra, interpret. 3=4837
 electrocorundum, absorption, rel. to colour centres 3=15515
 fluorite 3=8458
 gases, condensed, at low temps., review 3=10929
 glass, Na borate and silicate, u.v. absorpt., composition and temp. effects 3=13173

Spectra—contd

inorganic solids—contd

- glasses, titaniferous, rel. to coord. state 3=25459
 guanadine Al sulphate hexahydrate, Cr³⁺ absorption spectrum 3=936
 i.r. absorption lines, rel. to temperature and intermolecular vibrations 3=15662
 i.r. absorption at longit. optic freqn. 3=15663
 impurity absorption bands, vibr. structure 3=8587
 impurity absorption near exciton bands, theory 3=17993
 ionic crystals, u.v. absorpt., interpretn. 3=929
 Intran-1 3=20480
 metal films, plasma reson. due to fast electron 3=8407
 metallic oxides, reflection, 300-1000 mμ 3=13154
 micas, muscovite, 0.3-16 μ, classification 3=25463
 muscovite, vibrations of OH ions 3=13164
 nitrates, i.r., lattice freqn. and rotational barriers 3=746
 octahedral crystal fields, with Cr³⁺ 3=25454
 α-quartz, with Ge impurities, absorption, rel. to X-irrad. 3=22832
 rare earth cpds. (24), absorption 3=11038
 rare-earth iron garnets, far i.r. absorption 3=8597
 reflection bands, rel. to nature of incident light 3=9600
 ruby, ⁴A₂ → ²F₁ transition, identification of components 3=3015
 ruby, R lines, linewidth and temp. shift 3=15690
 ruby, symmetry 3=13183
 rutile, far i.r. polarized reflection 3=15687
 semiconductor lattice i.r. absorption bands, shell model applic. 3=10927
 semiconductors, absorption edge line structure as examination tool 3=2994
 semiconductors, absorption rel. to impurity levels 3=10733
 semiconductors, bound electrons or excitons with coupled phonon field 3=10906
 semiconductors, i.r., and electron states and phonon spectra 3=15667
 semiconductors, optical and nonradiative transitions, temp. depend., calc. 3=23032
 semiconductors, refl., plasma oscill. theory 3=8584
 semiconductors, u.v. reflectance edges, exciton-induced images of phonon spectra 3=20442
 silica-alumina, i.r. study of surface 3=11313
 silicate glass, i.r., 4.2° to 773°K 3=3019
 spinels, i.r. absorpt. and cation distrib. 3=13184
 3d metals, M_n, emission spectra 3=8605
 titanates, oscillation freqn. interpret. 3=25180
 vacuum u.v. radiation physics, conference 3=5515
 Ag halides, with O, S, Se, Te substitutional impurities 3=3022
 Ag halides, Ni²⁺ absorption spectra 3=6654
 AgBr-AgCl mixed crystals, absorption tail 3=3020
 AgBr, CdS-doped, meas. and model 3=18006
 AgBr:Ni, effects of irrad. and heat treatment 3=13187
 AgCl, Co²⁺ and Ni²⁺ impurities 3=15487-8
 AgCl, reflection, u.v. at 20°K 3=4959
 AgCl, trapping level spectrum, thermal effects 3=8397
 AgCl, u.v. absorpt. 3=929
 AgI, exciton, absorpt. and refl. 3=4975
 AlLaO₃, La³⁺ replaced by Nd³⁺, Al³⁺ by Cr³⁺ 3=15670
 Ar, u.v. absorpt., 20°-50°K meas. 3=2998
 As₂Se₃-type glasses, far i.r. 3=10930-1
 Au-Ni thin films, i.r. absorpt. 3=8580
 BaF₂, coloration, rel. to Mollwo relation 3=2837
 BaF₂, Er²⁺ absorption 3=3000
 BaF₂, Yb²⁺ absorption 3=3000
 BaNa₂ u.v. absorption meas. 3=25450
 BaTiO₃, BaTiO₃(70%)SrTiO₃(30%), i.r., 670-15 cm⁻¹, absorpt. 3=23064
 Be, K-emission band meas. 3=8605
 CBr₄, vibration spectra 3=15677
 ((CH₃)₄N)₂Cr₂O₇, electronic absorpt. spectrum 3=15671
 CO, i.r. 3=1693
 CO, 1-0, 2-0, 3-0 bands 3=17572
 CS₂, absorption bands 3=17999
 Ca fluorophosphate, Mn²⁺ absorpt. 3=13168
 CaF₂, coloration, rel. to Mollwo relation 3=2837
 CaF₂, Er²⁺ absorption 3=3000
 CaF₂(Eu²⁺), Zeeman and uniaxial stress spectra 3=10943
 CaF₂:Ho, absorption, rel. to impurity ion behaviour 3=8710

Spectra—contd

inorganic solids—contd

- CaF₂:Nd³⁺ 3=13167
 CaF₂:Sm²⁺, absorption, Zeeman effect 3=18026
 CaF₂, Yb²⁺ absorption 3=3000
 CaF₂, Y-doped, coloured by X-rays 3=8593
 CaF₂:Y³⁺(4d¹) 3=15516
 CaO, after neutron irrad. 3=13109
 CaSO₄.2H₂O, reflection, vibration states 3=23038
 Cd films, u.v. absorption 3=11318
 CdF₂, single crystals, pure and rare-earth doped, 0.2-15 μ 3=3003
 Cd_xHg_{1-x}Te solid solution, i.r. absorption, rel. to composition 3=17997
 CdO films, doped and undoped 3=25359
 CdS, absorption, with polarized light and green-edge emission, rel. to pressure, 77°K 3=931
 CdS, bound exciton complexes, props. 3=6651
 CdS crystal excitons 3=22689
 CdS, dispersion and exciton absorption band 3=18000
 CdS i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
 CdS, large crystals, rel. to defects 3=17704
 CdS layers, 0.4-18 μ, impurity effects 3=20469
 CdS, optical absorption, 4-2°K, and excitons 3=8594
 CdS, phonon peaks in i.r. absorption 3=10947
 CdS, reflection, dispersion effect 3=15652
 CdS, reflection, of wurtzite structure 3=8583
 CdS, rel. to field emission spectrum 3=16972
 CdS, sharp lines rel. to bound excitons 3=10630
 CdSb, absorption, rel. to band structure 3=10811
 CdSb, i.r. absorption, pleochroism 3=923
 CdSe, doped with Ga, Burstein effect 3=915
 CdSe, exciton line and lattice defects 3=6652
 CdSe, reflection, of wurtzite structure 3=8583
 CdTe, fundamental reflectivity 3=17979
 Co²⁺ in LiF and KMgF₃ 3=20043
 CoBr₂, absorption, crystal-field spectra of d³, d⁷ ions 3=25453
 CoCl₂, absorption, crystal-field spectra of d⁷, d⁹ ions 3=25453
 CoCl₂²⁻ in crystalline environments 3=20472
 CoF₂, antiferromagnetic resonance in far i.r. 3=15930
 CoF₂, i.r. absorption, effect of antiferromag. ordering 3=15673
 CoWO₄, absorption, crystal-field spectra of d³, d⁷ ions 3=25453
 Cr cpds., X-ray emission, chemical-bond effects 3=23086
 Cr in K₂CrO₄ and K₂NbO₅-K₂CrO₄ 3=3166
 Cr²⁺, in chloride and sulphate hydrates 3=23066
 Cr³⁺ ions in crystals, molecular orbital theory 3=13163
 CrBr₃, absorption, rel. to mag. props. 3=15656
 Cr₂O₃, Cr³⁺ lines, exchange splitting 3=15672
 Cr₂O₃ and ruby, comparison of crystal fields 3=15675
 CsBr, colloid absorpt. band at 1050 mμ 3=25451
 CsF, absorption, after X-irradiation, 295, 80, 18°K 3=15676
 CsI, u.v. absorpt. 3=13179
 Cu halides, exciton, low-temp. 3=10934
 CuBr, exciton, absorpt. and refl. 3=4975
 CuCl, absorption and reflection 3=15678
 CuCl, exciton, absorpt. and refl. 3=4975
 CuCl, exciton spectrum, elec. field effects 3=8405
 CuCl, new absorption lines 3=25456
 CuI, exciton, absorpt. and refl. 3=4975
 CuI films, exciton absorpt. bands, 82°K 3=20473
 CuO, light blue and blue regions, absorption 3=4971
 Cu₂O, absorption 3=10936
 Cu₂O absorption, low-temp. photometric study 3=4972
 Cu₂O, absorption, rel. to exciton states 3=10631
 Cu₂O, blue exciton reflection, rel. to energy band structure 3=15650
 Cu₂O crystal excitons 3=22689
 Cu₂O, exciton, class 1 and 2, low-temp. quantitative 3=10935
 Cu₂O, exciton scattering 3=17690
 Cu₂O, exciton spectra, theory 3=3004
 Cu₂O, i.r. absorption, rel. to lattice vibrations 3=22735
 Cu₂O, two new feeble lines at 4.2°K 3=20474

Spectra—contd

inorganic solids—contd

- Cu₂O, yellow exciton absorption, effect of deformation 3=3005
 Cu₂O, yellow exciton series, effect of Ag impurities 3=932
 Cu₂O, yellow series, n = 1 line, oscillator strength 3=23068
 Er ferrite garnet, absorption, near i.r. 3=20475
 Er, visible, rel. to 4f shell transitions 3=13182
 Er³, in YGa garnet, rel. to crystal potential 3=13172
 (Er,Y)₂O₃, rel. to Er ions interact. 3=10565
 Eu (trivalent) salts, u.v. absorption 3=10944
 Eu³⁺ in LaCl₃ 3=15683
 GaAs, emission line narrowing, rel. to exciton binding 3=15659
 GaAs, phonon peaks in i.r. absorption 3=10947
 GaAs, recombination, effect of doping 3=20476
 GaAs, recombination radiations, 77-300°K, diode 3=17990
 GaAs, reflectance, for 1.5-25 eV photons 3=8584
 GaAs, reflection, 2 to 5 eV 3=925
 GaAs, semiconducting diodes, 2-1°K, donor-acceptor absorbt. 3=25458
 GaP, 8 to 12 μ absorption, rel. to 3-phonon combination bands 3=20085
 GaP, emission and absorption near band edge 3=10949
 GaP, lines due to excitons bound to defects 3=25253
 GaP, reflectance, for 1.5-25 eV photons 3=8584
 GaP-GaAs, i.r. absorpt., p,n-type material 3=20477-8
 GaS absorption, 4° to 300°K, rel. to photon energy 3=10950
 GaSb, recombination emission, rel. to exciton and impurity absorption and emission 3=10948
 GaSb, reflection, 2 to 5 eV 3=925
 GaSe absorption, 4° to 300°K, rel. to photon energy 3=10950
 GaTe absorption, 4° to 300°K, rel. to photon energy 3=10950
 GaTe, optical absorption edge, rel. to temp. 3=3007
 Ge, absorption edge broadening 3=10951
 Ge, absorption near fund. edge 3=10954
 Ge films, 12-60 m μ , absorption, from 0.4-0.7 μ 3=10953
 Ge, free-electron i.r. absorption, 77° to 373°K 3=10925
 Ge, frustrated total internal reflection, surface levels 3=2989
 Ge, i.r. absorption, high doping effect 3=15679
 Ge i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
 Ge, n and p doped, i.r. absorption 3=935
 Ge, reflectance, for 1.5-25 eV photons 3=8584
 GeS, absorption 3=2990
 GeS₂, absorption 3=2990
 Ge-Si(0-34%) alloys, reflection, 2 to 5 eV 3=925
 Ge-ZnS films, i.r. transmission curves 3=10952
 Ge₂H₆ and Ge₂D₆ 3=2627
 HBr, absolute i.r. intensities 3=25460
 HBr, cryst., far i.r. at 77°K 3=938
 HCl, absolute i.r. intensities 3=25460
 HCl, cryst., far i.r. at 77°K 3=938
 Hg halides, exciton, low-temp. 3=10934
 HgI₂ crystal excitons 3=22689
 HgI₂, spectra, absorbt., emission, reflection, 4-290°K, various forms 3=25462
 α -HgS, absorption edge, effect of elec. field 3=6600
 HgTe, fundamental reflectivity 3=17979
 HoFe garnet, far i.r. absorption 3=15680
 I crystals, absorption edge, temp. shift 3=6653
 InAs, reflectance, for 1.5-25 eV photons 3=8584
 InAs, reflection, 2 to 5 eV 3=925
 InSb, carrier-recombination radiation 3=4924
 InSb, magneto-absorption 3=10924
 InSb, reflectance, for 1.5-25 eV photons 3=8584
 InSb, reflection 2 to 5 eV 3=925
 K azide cryst., i.r. 3=18004
 K dihydrogen phosphate, relaxation in extreme i.r. 3=17942
 K halides, doped with O, S, Se, Te, absorpt. 3=2999
 K halides, reflectance, rel. to exciton processes 3=25433
 KBr, absorpt. bands due to anionic impurities 3=25464
 KBr, absorption, after electron probe irradi. 3=8460

Spectra—contd

inorganic solids—contd

- KBr, coloration near fundamental edge 3=15517
 KBr, vacuum u.v., α and β absorpt. bands 3=8590
 KCl, absorption, effect of OH⁻ ions 3=18005
 KCl, coloration near fundamental edge 3=15517
 KCl, u.v. absorpt. 3=13179
 KCl, vacuum u.v., α and β absorpt. bands 3=8590
 KCl, X-rayed, u.v. absorption 3=3013
 KCl: Ag, X-irrad., trapped holes and electrons 3=5044
 KCl-NaCl, colloidal band absorption 3=930
 KCoF₃, absorption, crystal-field spectra of d³, d⁷ ions 3=25453
 K₂Cr₂O₇, electronic absorpt. spectrum 3=15671
 K₂Fe(CN)₆, absorption, 20-28 kK, rel. to temp. 3=3011
 K₂HgI₄, K₂HgI₃.H₂O, powder diffuse reflectance, u.v. 3=23557
 KIO₃, powder, diffuse reflectance, u.v., for chemical analysis 3=23557
 KI:TL, i.r. absorption, γ -irrad. effects 3=25449
 KMgF₂ Ni²⁺, 300°-4.2°K meas. 3=12892
 KNiF₃, molec. orbital analysis 3=933
 KNiF₃, 300°-4.2°K, covalency effects 3=12892
 KH₂PO₄, far i.r. polarized reflection 3=15687
 K₂IrCl₆ 3=4973
 K₂O.3Al₂O₃.6SiO₂.2H₂O, muscovite, absorption rel. to added KBr 3=10958
 KNiF₃, antiferromagnetic resonance in far i.r. 3=15930
 Kr, u.v. absorpt., 20°-50°K meas. 3=2998
 LaF₃:Er³⁺, 3500-10000 Å 3=25457
 LaF₃, Nd³⁺ doped, hidden selection rule 3=20481
 LaF₃:Pr, absorption 3=23072
 Li, K-emission bands meas. 3=8605
 LiCrGeO₄, i.r. absorpt. 3=13175
 LiF, absorpt., sharp lines due to X-irrad., 3=23073
 LiF, absorption, after electron pulse irradi. 3=8460
 LiF: Co, absorption, X-irrad. and non-irrad. 3=8598
 LiF, extreme u.v. absorption, rel. to exciton interaction 3=10955
 LiF, γ -irrad., F and M-centres 3=25300
 LiF:hexavalent U, piezo-effect 3=8619
 LiF, i.r. absorption at longit. optic freqn. 3=15663
 LiF, i.r. absorption, γ -irrad. effects 3=25449
 LiF, transmittance, vac. u.v., rel. to crystal surface 3=15682
 LiF, vacuum u.v., absorpt. and refl. 3=8596
 LiF, vacuum u.v. incremental absorption, rel. to X-irrad. 3=13145
 LiH, u.v. absorpt. 3=13179
 LiOD, i.r. absorpt., interpretation 3=13176-7
 LiOH, i.r. absorpt., interpretation 3=13176-7
 Li₂(Si, Ge)O₃ mixtures, i.r., vibr. analysis 3=10579
 Mg, far u.v. absorption 3=10956
 Mg₂Ge, i.r. reflection 3=15653
 Mg-Nd double nitrate, reflection 3=23063
 MgO, absorption bands, rel. to point defects 3=22717
 Mg₂Si, i.r. reflection 3=15653
 Mg₂Sn, i.r. reflection 3=15653
 Mg, Sn, Pb_{1-x}, absorption edge rel. to composition 3=869
 Mn in solid Ar, absorption 4°K 3=23074
 MnF₂, absorpt. bandwidth, temp. depend. 3=25461
 MnS, α , β and γ -phases, reflection 3=20072
 MoS₂, thin crystals, absorption 3=10957
 NH₄ dihydrogen phosphate, relaxation in extreme i.r. 3=17942
 NH₄ halide phosphors, explanation 3=23100
 (NH₄)₂Cr₂O₇, electronic absorpt. spectrum 3=15671
 NH₄H₂PO₄, i.r. 3=15342
 NO, in crystalline Kr 3=15685
 NOBr and NOCl, i.r., environmental effects 3=8599
 Na borate glass, u.v. absorpt., composition and temp. effects 3=13173
 Na silicate glass, u.v. absorpt., composition and temp. effects 3=13173
 NaBrO₃, reflection, i.r., n(λ), k(λ) calc. 3=20438
 NaCl, absorption, after electron probe irradi. 3=8460
 NaCl, absorption, u.v., β -band maxima calc. and F' centres 3=20487
 NaCl, Cu impurities, absorpt. band at 253 m μ 3=10651
 NaCl, OH⁻ bands, origin 3=20488

Spectra—contd

inorganic solids—contd

- NaCl, Na₂CO₃ and NaOH doped, i.r. absorpt., reflection 3=20489
 NaCl, u.v. absorpt. 3=929
 NaCl, vacuum u.v., α and β absorpt. bands 3=8590
 NaCl:Ag, absorption, fine structure 3=23078
 NaCl:Cu, meas. 3=18008
 NaClO₃, reflection, i.r., $n(\lambda)$, $k(\lambda)$ calc. 3=20438
 Na₂Cr₂O₇, electronic absorpt. spectrum 3=15671
 NaF, i.r. absorpt. 3=10966
 NaF, OH⁻ absorption band, distrib. 3=18223
 NaF, u.v. absorpt. 3=13179
 NaF, vacuum u.v., α and β absorpt. bands 3=8590
 NaFe fluoride, absorption peaks 3=25547
 NaI:Ti, Ti conc. and temp. depend. 3=20490
 NaI:Ti, i.r. absorption, γ -irrad. effects 3=25449
 Na₂Mo₂O₇, i.r., anion structure 3=4974
 Na₂O.B₂O₃.SiO₂ glass, rel. to ionizing radiations 3=17795
 Na₂V₂O₇, i.r., anion structure 3=4974
 Na₂W₂O₇, i.r., anion structure 3=4974
 Nd-activated glass, as optical quantum generator, flash spectrum time variation 3=25444
 Nd in SrF₂ 3=20482
 Nd, visible, rel. to 4f shell transitions 3=13182
 Nd³⁺ in LaBr₃, single crystal absorption 3=3009
 Ni phosphates, substituted, 6-30 μ 3=15686
 Ni, u.v. and visible, by H ion bombardment, 200 keV 3=7657
 NiF₂, antiferromagnetic resonance in far i.r. 3=15930
 Ni(NH₄)₂(SO₄).6H₂O absorption, 1.7° to 290°K 3=13180
 P compound molecular groups in crystals, in i.r. vibration frequencies 3=20483
 PbF₂, exciton band at 2190 Å 3=24050
 Pb halides, exciton, low-temp. 3=10934
 PbMoO₄, absorption, effect of preparation method 3=20479
 PbO, diffuse-reflection, rel. to activation energy 3=17978
 PbS, reflectance, data or refr. index 3=25436
 Pr, visible, rel. to 4f shell transitions 3=13182
 Pr³⁺, configuration interaction 3=10960
 Pr³⁺ in ethylsulphate crystals 3=10959
 Pr³⁺ in rare-earth trichlorides, anion effects 3=13181
 Pr³⁺ in LaBr₃, absorption 3=3014
 PrCl₃, ion-pair absorption lines, 22220-28100 cm⁻¹ 3=23075
 Pu³⁺ in La trichloride 3=8601
 RbBr, u.v. absorpt. 3=13179
 S, rhombic, i.r. transmission 3=8603
 SbSI, absorpt. edge shift in elec. field 3=20468
 Sb₂S₃-Sb₂Te₃ system 3=15585
 Se, amorphous and impure, absorption spectrum 3=3017
 Se, i.r. absorption by free carriers 3=13188
 Se, vacuum u.v., absorpt. and refl. 3=8596
 Se, vitreous, absorption 3=13081
 Se, vitreous and metallic, reflectance 3=15651
 Si, absorption band temperature variation, rel. to O impurity 3=23077
 Si, i.r. absorption of defects, rel. to irradiation 3=23076
 Si, i.r., broadening, due to B doping, mechanisms 3=23080
 Si i.r. emittance rel. to absorption processes, 323° to 473°K 3=10961
 Si, intrinsic absorption, heavy doping effect 3=15688
 Si, n and p doped, i.r. absorption 3=935
 Si, n- and p-type, i.r. absorption rel. to neutron-irrad. 3=3018
 Si, phonon absorption bands 3=23044
 Si, reflectance, for 1.5-25 eV photons 3=8584
 Si, u.v. reflection, rel. to strong doping 3=18007
 SiC, absorption edge and u.v. spectrum 3=20485
 Sm, visible, rel. to 4f shell transitions 3=13182
 Sm²⁺ in alkali halide crystals, absorpt., 300, 77°K 3=23079
 SmCl₃ 3=3016
 SmFe garnet, far i.r. absorption 3=15680
 SnI₄, far i.r. absorpt. 3=8604
 SrF₂, colouration, rel. to Mollwo relation 3=2837
 SrF₂, Er³⁺ absorption 3=3000
 SrF₂:Nd 3=20482
 SrF₂:Sm²⁺, absorption, Zeeman effect 3=18026
 SrF₂, Y-doped, coloured by X-rays 3=8593

Spectra—contd

inorganic solids—contd

- SrN₆, u.v. absorption meas. 3=25450
 SrTiO₃, i.r., 670-15 cm⁻¹, absorpt. 3=23064
 Tb³⁺ in LaCl₃ and YCl₃ 3=15689
 Ti—O system, i.r. 3=20491
 TiO, diffuse reflectance, in visible and near u.v. 3=23040
 TiO₂:Cu, absorpt. bands 3=25564
 TiO₂, diffuse reflectance, in visible and near u.v. 3=23040
 Ti₂O₃, diffuse reflectance, in visible and near u.v. 3=23040
 TiCl₄, absorpt. and reflectivity spectra 3=3023
 U fluorides, pentavalent, near i.r. absorption 3=18011
 V—O system, i.r. 3=20491
 Xe, u.v. absorpt., 20°-50°K meas. 3=2998
 YAl garnet, Pr-doped, absorption 3=23072
 Y(Gd)Cl₃.6H₂O, u.v. absorption 3=10945
 YH₃ and YD₃, i.r. 3=17658
 YbFe garnet, ferrimagnetic resonance in far i.r. 3=15930
 Zn-blende materials, absorption near fund. edge 3=10954
 Zn_{0.9}Cd_{0.1}Sb, i.r. absorption, pleochroism 3=923
 ZnO 3=957
 ZnO, diffusion reflectance, visible and near u.v. 3=13190
 ZnO, diffusion reflectance, visible and near u.v. 3=13190
 ZnS, absorption, rel. to elec. vector orient. 3=10970
 ZnS:Cu, prep. by neutron irrad. of ZnS 3=13207
 ZnS, effect of u.v. irrad. in different gases 3=10969
 ZnS lattice absorption, 8° to 420°K 3=10967
 ZnS, reflection, for wurtzite structure 3=8583
 ZnS, rel. to impurities 3=20528
 ZnTe, fundamental reflectivity 3=17979
 ZnTe, optical edge absorption 3=10968
 ZnTe, reflection, rel. to band model 3=25467
 ZnTe, sharp lines rel. to bound excitons 3=10630
inorganic solids, radiofrequency
 See also Nuclear magnetic resonance and relaxation;
 Paramagnetic resonance and relaxation.
 glasses, B₂O₃, Na borates 3=13174
 silica gels, microwave and dipolar 3=22984
 zeolites, microwave and dipolar 3=22984
 B₂O₃, glass 3=13174
 Na borate glasses 3=13174
 Sb in Ge, Lyman series, chemical splitting 3=939
organic molecules and substances
 See also Molecules.
 acridone solns., no evidence of association 3=141
 alcohol—water soln., NaCl₃ absorption, -87°C 3=1691
 amine—chloranil complexes, absorption 3=1694
 anthracene, solutions, changes on addition of ferric acetylacetonate 3=15359
 anthrols, electronic spectra and H bonding 3=8287
 aromatic free radicals, g factors theory 3=20029
 azobenzene, π -electronic u.v. studies 3=25133
 azoxybenzene, π -electronic u.v. studies 3=25133
 benzalaniline, π -electronic u.v. studies 3=25133
 benzene, crystalline, u.v. 3=10586
 benzene, Raman and electronic abs. spectra 3=15319
 benzene, unresolved bands, mol. consts. det. 3=10482
 benzene, vapour and solid 3=20493
 benzophenone solutions, stimulated light emission 3=23886
 1 bromo-2-chloroethane, far i.r. 3=24031
 1,3-butadiene u.v. absorption cross-sections 3=1932
 n-butane u.v. absorption cross-sections 3=1932
 carbon tetrachloride, Raman and electronic abs. spectra 3=15319
 carbonyl, 3000 Å absorption, mag. dipole character and rotatory power 3=728
 carbonyl, vacuum u.v. electronic transitions, correl. 3=22583
 carboxyl, vacuum u.v. electronic transitions, correl. 3=22583
 cis-butene-2 u.v. absorption cross-sections 3=1932
 condensed medium, correcting for universal effective field 3=25077
 crystals, π -electron, triplet exciton interactions 3=25492
 cyanogen, rotational analysis of 3000 Å absorpt. system 3=22582
 cyclic ethers, vac. u.v. absorption 3=15365
 cyclopentane u.v. absorption cross-sections 3=1932

Spectra—contd

organic molecules and substances—contd

- diatomic, symmetric-top, unresolved bands, mol. consts. det. 3=10482
 dimethyl ether, vac. u.v. 3=12851
 2,5-diphenyloxazole solns., rel. to concn. 3=1701
 di-tetramethyl ammonium uranium hexachloride 3=8343
 electro-optical parameter theory, H-D isotope effects 3=25114
 Elsasser band, transmissivity 3=15322
 eosin, influence of solvent mixture of MAM or ethanol 3=21378
 ethane u.v. absorption cross-sections 3=1932
 ethylene u.v. absorption cross-sections 3=1932
 fluorescein, u.v., visible and i.r., by quantum chemistry 3=2647
 formaldehyde, mag. dipole transition 3=12852
 formaldehyde, 3000 Å absorption, mag. dipole charac. and rotatory power 3=728
 guanidine Cr sulphate hexahydrate, polarized light absorpt., 1.7°, 4°, 20°K 3=13192
 holmium ethyl sulphate, optical absorpt. 3=8600
 hydrocarbons, unsat., Raman and electronic abs. spectra 3=15319
 isopentane, dispersion curves 3=17592
 liquids, vibration absorpt. bands, intensity, temp. depend. 3=21376
 methyl alcohol, in acetonitrile, O—H bond 3=8285
 methyl bromide, unresolved bands, mol. consts. det. 3=10482
 3-methylaminophthalimide, effect of medium 3=1703
 methylcyclohexane, fluorinated, dispersion curves 3=17591
 methylene, spin-spin interaction 3=17602
 naphthalene, u.v. 3200–2200 Å 3=934
 naphthalene, solutions, changes on addition of ferric acetylacetonate 3=15359
 octacyanide complexes 3=725
 n-octadecane, dispersion curves 3=17592
 octamethyltrisiloxane, liquid and crystalline, i.r. rel. to temperature 3=14169
 organophosphors, absorpt. spectra 3=20492
 oxadiazoles, absorption, rel. to 1-methylnaphthalene 3=18815
 oxazoles, absorption, rel. to 1-methylnaphthalene 3=18815
 2,2'-paracyclophane, electronic spectrum 3=4773
 n-pentane, dispersion curves 3=17592
 n-pentane u.v. absorption cross-sections 3=1932
 n-perfluoroheptane, dispersion curves 3=17591
 phenoxy radical in nitrogen matrix, rel. to photolysis 3=3403
 phthalic acid, powder, reflection, rel. to absorbed layer 3=23062
 phthalocyanine crystals, polarization 3=20495-6
 phthalocyanine, metal-free single crystals 3=10971
 phthalocyanines, rel. to degrees of association 3=18013
 polyenes, substituted, in various solvents 3=23891
 POPOP, solvent effect, dipole moments 3=25127
 porphyrin charge-transfer complexes with sym-trinitrobenzene 3=2651
 porphyrins 3=25129
 propane u.v. absorption cross-sections 3=1932
 propylene u.v. absorption cross-sections 3=1932
 purines, single crystals, polarized absorption spectra 3=25131
 pyrazine, ground-triplet transitions and mixing 3=22588
 pyrene, solutions, changes on addition of ferric acetylacetonate 3=15359
 pyridine, ground-triplet transitions and mixing 3=22588
 pyrimidines, single crystals, polarized absorption spectra 3=25131
 quasilinear, obtained at low temp. and in paraffin solid solutions 3=18012
 relation to fluorescence, mirror-image relation 3=23892
 rhodamine B, influence of solvent mixture of MAM or ethanol 3=21378
 riboflavin, on addition of amino-acids 3=8954
 simple molecules, theoretical computations 3=10500
 stilbene and derivs., absorpt. and fluoresc. 3=735
 stilbene, π -electronic u.v. studies 3=25133
 p-terphenyl solns., rel. to concn. 3=1701

Spectra—contd

organic molecules and substances—contd

- tetrachloroethane, far i.r. 3=24031
 tetracyclic hydrocarbons and their alkyl-substituted derivatives 3=15360
 tetrahydrofuran, vac. u.v. 3=15365
 tetrahydropyran, vac. u.v. 3=15365
 tetramethyl-1,3-cyclobutanedione, u.v. 3=17606
 thionaphthalene, near u.v., vapour 3=15368
 trimethylene oxide, vac. u.v. 3=15365
 triphenylmethyl, absorption and fluoresc. spectra at 4.2°K 3=4976
 uranyl acetate, absorption bands analysis 3=8282
 CH₄ 3=7328
 CH₃ 3=7328
 C₂H₄, absorpt., 1900–2200 and 4400–6750 cm⁻¹ 3=10531
 CH and CD, mol. consts. 3=25119
 CH band, blackening in hollow cathode 3=19936
 CH₄, emission, excited by protons and H atoms 3=15338
 CH⁺ (¹H-¹Σ) cometary band, rot. temp. 3=25118
 CN(^Σ⁺ - ^Σ⁺) system, temp. meas. 3=12846
 CN and N₂ bands in discharges through nitrogen-organic substances 3=12850
 Co phthalocyanine crystals, absorpt. polarization 3=20495-6
 Cu acetylacetonate, polarized absorption, 11 000 to 22 000 cm⁻¹, 30° to 300°K 3=3027
 Cu, phthalocyanine crystals, absorpt. polarization 3=20495-6
 Eu dibenzoyl-methide, stimulated light emission 3=23886
 Eu thenoyltrifluoroacetate, absorption and emission 3=23888
 Eu³⁺ in organic matrix solid solution, stimulated emission 3=25443
 HNCN, free radicals 3=8307
 La ethyl sulphate, Pr-doped, absorption 3=23072
 La ethylsulphate, with Pu⁴⁺ 3=8601
 Ni phthalocyanine crystals, absorpt. polarization 3=20495-6
 Ti³⁺ in alcohol and glycerol, visible region absorption 3=1712
- organic molecules and substances, infrared**
 acetonitrile, i.r. absorpt., temp. depend. 3=8286
 acetylene acid, and D-substitution product, i.r. absorption 3=15366
 acetylene-d₁, i.r., 1900–3400 cm⁻¹ 3=2637
 N-alkyldithiocarbamate complexes with metals, normal coordinate analysis 3=25120
 band shape calc., overlapping rotational lines 3=17554
 benzene, absorption, rel. to pressure 3=25116
 benzene, crystalline, films 3=13191
 benzene-deutero benzene mixed crystals, absorption intensities 3=23081
 benzoic acid and o-halogen derivs. 3=733
 carbon disulphide, liquid, reflection 3=16624
 carbon tetrachloride, liquid, reflection 3=16624
 carbonyl group mol. environment, effect on i.r. intensity 3=6405
 carbonyl, splitting due to water 3=8283
 centrifugal distortion effects in asymm. rotator 3=2595
 chloranil, effect of particle size on molar absorptivity 3=14346
 cyclohexane, i.r. absorpt., temp. depend. 3=8286
 dithiocarbamate complexes with metals, normal coordinate analysis 3=25120
 electrolyte solutions, ionic interactions with solvent molecules 3=21375
 ethane 3=4766
 ethane (C¹³C¹²H₆), $\nu_1 + \nu_6$ band 3=20007
 ethanol adsorbed on Al₂O₃ surfaces 3=3362
 ethyl fluoride, barrier to internal rotation 2=25121
 ethylene acid, and D-substitution product, i.r. absorption 3=15366
 ethylene and C₂D₄, crystalline, absolute intensities 3=6656
 hydrocyanic acid, and D-substitution product, i.r. absorption 3=15366
 i.r. absorption lines, rel. to temperature and intermolecular vibrations 3=15662
 i.r., adsorbed layers 3=21285
 i.r. band intensity and structure 3=25076

Spectra—contd**organic molecules and substances, infrared**—contd

- i.r. overtones and combination tone intensities, general formula 3=10526
 i.r., solvent effects 3=22521
 isopropanol 3=12853
 ketene, and deuterated ketenes 3=17600
 ketene and deuteroketenes 3=12854
 malononitrile, in solid Ar matrix 3=10527
 methane-d₄, two bands, analysis 3=12855
 methane, deuterated (CH₃D) 3=22587
 methanol adsorbed on Al₂O₃ surfaces 3=3362
 methylacetylene, contour of ν_1 band 3=4770
 methylgermane 3=17603
 methylsilylacetylene 3=4771
 pentachloroethane, far i.r. 3=24031
 phenanthrene, single crystals, exciton absorption band region 3=20494
 phenylacetylenes, intensities of C \equiv C and \equiv C—H bands 3=10537
 phthalocyanine, metal-free single crystals 3=10971
 polyacenes, triplet—triplet absorption, polarization 3=23082
 polyethylene, crystals, absorption 3=23083
 polyethylene glycol, polarized spectra 3=6444
 polyethylene, vibr. spectrum 3=10556
 polyoxymethylene 3=10557
 polypropylene, isotactic 3=17624
 pyrene, 4000–400 cm⁻¹ 3=25468
 toluene, i.r., absorpt. frequ. and intensities 3=25469
 toluene, i.r. absorpt., temp. depend. 3=8286
 tricyanomethanide ion 3=6407
 triglycine sulphate, polarized reflection 3=15687
 vibration, H bond, proposed study 3=6378
 vibrational, of excited electronic states, excitation modulation spectroscopy 3=12802
 p-xylene, i.r. intensity calculation 3=15369
 BF₃·diethyl ether 3=15361
 BF₃·tetrahydrofuran 3=15361
 CCl₄, liquid, absorption, 740–810 cm⁻¹ 3=23884
 CF₄, 1850–3100cm⁻¹ 3=6406
 CF₃SD, i.r., rel. to internal rotation 3=6401
 CF₃SH, i.r., rel. to internal rotation 3=6401
 CH₃, and vibr. assignments and excitation energies 3=15363
 CHCl₃, liquid, absorption, 740–810 cm⁻¹ 3=23884
 COOH group, characteristic frequs. 3=733
 Co(II) pyridine complexes, thiocyanate group 3=22581
 Cu(II) pyridine complexes, thiocyanate group 3=22581
 HNC 3=22584
 Ni(II) pyridine complexes, thiocyanate group 3=22581

organic molecules and substances, radiofrequency

See also Nuclear magnetic resonance and relaxation;
 Paramagnetic resonance and relaxation.

- acetonitrile-d₃ 3=6408
 benzonitrile, structural detm. by microwave spectra 3=2640
 butyl acetylene, tertiary, *l*-type doubling and resonance 3=19960
 butyronitrile, rotational isomers 3=6409
 carbonyl fluoride 3=6410
 centrifugal distortion effects in asymm. rotator 3=2595
 chlorodifluoromethane 3=6411
 cis-crotononitrile 3=17594
 cyanamide, HDNCN and D₂NCN, 17–57 Gc/s 3=10532
 difluoroethylenes 3=17595
 dimethyl ether 3=17596
 dimethyl sulphide, torsional fine structure 3=2644
 ethyl alcohol, 20.7–31.7 kMc/s, dipole moment 3=20002
 ethyl bromide 3=17597
 fluoroprene, 8–35 kMc/s 3=2641
 formaldehyde and isotopic species, mm region 3=25123
 formaldehyde, (6.3) rotational spectrum 3=25122
 formaldehyde, u.h.f., Q-branch transitions 3=25124
 formaldoxime 3=17598
 ketene and deuteroketenes 3=12854
l-type doubling and resonance, interpret. 3=19960
 meta-fluorochlorobenzene, 10.5–26.3 Gc/s 3=4768
 methyl acetylene, *l*-type doubling and resonance 3=19960
 methyl alcohol microwave, σ -Stark effect 3=734
 methyl cyanide, *l*-type doubling and resonance 3=19960

Spectra—contd**organic molecules and substances, radiofrequency**—contd

- methyl fluoride, Stark effect 3=17601
 monofluoroacetonitrile 3=4772
 n-propyl chloride, 2 rotational isomers 3=25130
 propylene sulphide 3=20009
 silyl acetylene, isotopic species, microwave 3=25132
 tertiary butyl chloride 3=12849
 trans-1-chloropropylene 3=2642
 vinylidene fluoride 3=17595
 (CH₃)₃C³⁵Cl, microwave spectrum 3=4769
 CH₃DCOH, CD₃HCOH, rotational analysis 3=8288
 CHOOCH₃, rotational analysis 3=8288

Spectral line breadth

See also Doppler effect; Stark effect; Zeeman effect.

- aberration tolerances of Strehl-intensity type 3=21547
 atomic beam sources, possible meas. from correl. expts. using coincidence counting 3=21511
 atoms, broadening by several atoms, theory 3=15273
 diatomic mols., vibr.—rot. bands, meas. 3=9510
 distortion, by photoelectric recording 3=14341
 Doppler and dispersion width, as Voigt functions 3=18988
 electron scatt., meas., low energies, Lindholm's theory 3=25063
 fluid, molecular expressions, model 3=7140
 gas pressure broadening, as relax. process 3=16663
 gases, interdependence with sound velocity and viscosity 3=16660
 gases, mechanisms, and profile meas. 3=14340
 line half-width, broadened by electron impact, calculation 3=8174
 long wavelength region 3=19466
 n.m.r. rotary saturation lines 3=20674
 plasmas, high-density relationships 3=1961
 pure rotation lines, widths and shifts 3=22542
 scanning with Fabry—Perot interferometer 3=21541
 spark discharges, time variation, ion concn. det. 3=2553
 statistics of radiative transition probabilities 3=4700
 vacuum arcs, magnetically confined, high current 3=19930
 Voigt profile, new tabulation 3=16764
 CO, 2 ν and 3 ν bands, self-broadening 3=19978
 CO, vibr.—rot. bands, foreign-gas effects 3=9511
 DCl, vibr.—rot. bands, foreign-gas effects 3=9511
 DCl³⁵, foreign gas effects 3=7244
 H β , H γ in arc discharge 3=21752
 H halides, vibr.—rot. lines, pressure effects 3=6377
 H plasma, Stark-broadened Balmer lines 3=8176
 HBr⁷⁹, foreign gas effects 3=7244
 HCl, foreign gas broadening calc. 3=173
 HCl overtone lines, self-broadened 3=4748
 HCl³⁵, foreign gas effects 3=7244
 HF, fundamental band, Lorentz parameters 3=2617
 HI 3=4749
 He—Ne gas laser beam 3=11908
 Hg, 2537 Å resonance line, in inert gases 3=706
 Kr gas discharge, Stark effect 3=4751
 Kr II in strongly ionized plasma 3=10454
 N IV in plasma, rel. to ion collective motion 3=24304
 Ne II in strongly ionized plasma 3=10454
 SO₂, broadening by N₂ 3=8279
 SO₂, collision broadening 3=17621
 SO₂, molecular interaction 3=12841
 Xe, population inversion, Doppler broadening 3=22493

Spectrochemical analysis

See also Chemical analysis, by mass spectrometry;
 Spectroscopy.

- absorption, atomic, use of Beer—Lambert law to improve cells 3=23556
 for adjacent elements 3=21018
 alkali metals in flames 3=8990
 alloys, spectrometers, U.S.S.R., U.K., U.S.A., performance. 3=25848
 analytical curves rel. to line profiles in absorption 3=18465
 arcs, electrode material emission mechanism 3=24252
 Beer's law and optimum transmittance 3=24041
 calibration, Lomakin-Shaibe formula, anomalies. 3=25852
 discharge erosive characteristics, spectrosc. investig. 3=24251
 use in forensic medicine. 3=25853

Spectrochemical analysis—contd

- globular arc, mechanism 3=24254
- hard-to-excite elements, low-voltage spark
investig. 3=25843
- i.r. plant stream analyser, ratio recording 3=24027
- intensity-blackening curve detm.; wavelength and processing
condition dependence 3=1405
- metals and alloys, high-melting, oxygen determ. 3=25851
- metals, by spark, h.f., surface phenomena. 3=25844
- opaque liquids, new technique 3=18989
- oximeter for blood, in vivo 3=3649
- process-stream, photoelectric 3=5175
- Raman, advances and appl. 3=5517
- rare earth, arc, atlas. 3=25854
- source unit, electronically controlled. 3=25842
- spectrophotometer, atomic absorption 3=24025
- steel, spectrometer, multichannel, photoelectric,
performance. 3=25849
- theory, review, plasma. 3=25841
- time resolved, new high precision system 3=1813
- Al alloys, spectrometer, multichannel, photoelectric,
performance. 3=25850
- Al-Cu, effect of Si, Zn 3=25846
- Al-Mg, effect of Si, Zn 3=25846
- Cu-Ni, Fe impurity intensity, effect of Ni conc. and
arc temp. 3=25840
- Cu with Zn, in discharge, effect of Si, Na, time
var. 3=25845
- KIO₃, diluted with inactive LiF, powder, diffuse reflectance,
u.v. 3=23557
- S, impurity effects, arcs. 3=25847
- Se, impurity effects, arcs. 3=25847
- Te, impurity effects, arcs. 3=25847
- U isotopes 3=18999
- X-ray microanalysis, low atomic no. elements 3=23089
- X-ray nondispersive, using β -ray source 3=21017
- Zn, concn. of 20 p.p.m., in plasma jet 3=1820
- Zn with Cu, in discharge, effect of Si, Na, time
var. 3=25845

Spectrometers

See also Mass spectrometers; Monochromators;
Spectrophotometers; Spectroscopy; X-ray spectro-
meters.

- aberration tolerances of Strehl intensity type 3=21547
- astronomical, concave gratings 3=9147
- astronomical, rocket-borne, for 1300-4000 Å 3=18584
- diffraction echellette grating, i.r. 3=16776
- distance bet. spectrum lines, precise meas. 3=1814
- Ebert and Ebert—Fastie, focal curves 3=7334
- Ebert-Fastie, i.r., performance 3=11916
- echellette, 140-1600 μ 3=21544
- echelle, crossed dispersion type 3=7341
- electrodeless discharge lamps, use of 3=18998
- far i.r., vacuum grating 3=24031
- for far u.v. continuous emission, spatial
distrib. 3=24249
- 55-1200 μ vacuum spectrometer 3=24032
- Fourier, two-grating interferometer 3=16770
- grating, Bass-Kessler type 3=16772
- grating, 40-170 μ , medium size 3=21545
- grating, grazing, vacuum, 6-265nm 3=14350
- grating, 2.2. m, for 2000-11 000 Å 3=16774
- grating, with 2 transmission gratings 3=24029
- high-speed, high-resolution, large aperture 3=24028
- i.r., 1.2-3 μ , with calibration device 3=24023
- i.r., single-beam, range 1250-100 cm⁻¹ 3=21543
- infrared spectrometer illumination device 3=24038
- intensity distribution distortion, rel. to interferometer
exit aperture 3=18995
- large-aperture, slitless, for high-speed projectiles in
rarefied air 3=7335
- Newtonian two-prism, astronomical 3=9153
- Pepsios interferometric scanning instr. 3=24020
- photoelectric correlator for laser-beam analysis 3=9596
- photoelectric grating, for astron. use 3=9148
- photoelectric, scanning, Abel inversion, use of analogue
computer, 3=14347
- photographic recording in vacuum u.v., review 3=21538
- for Raman spectra recording 3=24033
- recording spectrograph, for quartz transmission
range 3=24035

Spectrometers—contd

- solar radiation in far u.v. 3=23682
- spectrogram, broad line, meas., by scanner
comparator 3=16315
- spectroradiometer, wide-angle, 420-1100 nm 3=21542
- systematic errors, Van Cittert's reduction method 3=7340
- 2 metre grazing incidence, Jerusa. m 3=9593
- u.v., vacuum, grazing-incidence type 3=21546
- u.v., vacuum, review of grating theory 3=7338
- u.v., vacuum, 10 metre grating, design 3=14348
- ultraviolet spectrograph for pulsed events 3=7336
- vacuum 42 ft grazing incidence 3=7339
- vacuum u.v., 10.5 m 3=7328
- use of zone system at entry and exit slits 3=5521

accessories

- absorption cell, low-temperature double-beam 3=5518
- absorption cell, white, multiple pass 3=24022
- card punching comparator for wavelengths and wave-
numbers 3=18997
- comparator image inverter 3=24021
- direct recording of integr. band intensities 3=16773
- filter gratings, i.r., transmission echellette 3=16775
- filter, image-forming, using resonance scatt. 3=16780
- grating spectrometer, bore-prism drive 3=11915
- gratings and echelles, tandem use 3=5519
- i.r. plant stream analyser, ratio recording 3=24027
- i.r., polarizer, densitometer, cell 3=18990
- integrating sphere, asymmetry 3=16778
- Leitz spectrograph, 6:1 micro attachment for i.r. detection
of small quantities of substances 3=11919
- optical cell for Raman spectra at medium pres. 3=24034
- photoelectric recording attachment, for Soviet
instrument 3=21552
- photographic films, u.v., far, low fogging 3=24064
- predisperser for grating spectrographs 3=24026
- prism, reflection, for autocollimation alignment 3=21527
- prisms, fused silica, inhomogeneity compensation 3=21528
- sun-tracking head 3=21550
- window, AgCl cavity, for i.r. liquid cells 3=16779

Spectrometers, radiofrequency

- amplifier, parametric, as first stage of mag. res.
spectrometer 3=24485
- Boltzmann interferometer for plasma study,
0.1-10 mm 3=9957
- coaxial bridge, high-sensitivity 3=7724
- e.s.r., resonant-cavity and travelling-
wave types 3=516
- e.s.r., superheterodyne pulse spectrometer 3=7725
- e.s.r. 3 cm, with 3×10^{10} ΔH unpaired spin noise-level
equiv. 3=24486
- Fabry-Perot interferometer used 3=21984
- maser 3=12354
- piezoelectric coupling detection in powders 3=24504
- radioastronomical, 21cm 3=16430
- tube and parametric, band-width and sensitivity 3=24484
- Zeeman, for cm wavelengths 3=21983

NH₃ cell, direct absorption, near 23.86 Gc/s 3=3837

Spectrophotometers

See also Colorimeters.

- astronomical, pulse-counting, dual-channel 3=9145
- atomic absorption technique device 3=24025
- 8-14 μ , for extra-terrestrial objects 3=21080
- grating, photoelectric 3=18996
- i.r. 3=18990
- i.r., fiducial wavenumber marking system 3=7342
- luminescence, a.g.c. amplifier to correct for light
source varns. 3=5605
- microspectrophotometers with CdSe cells 3=24024
- modification, Beckman DK-2R, for light source, spectral
distrib., meas. 3=18991
- moving specimen intensity modulation for improved
sensitivity and accuracy 3=21551
- photoelectric, for sky light meas., 0.3 to 1.0 μ 3=1448
- portable spectro-radiometer for visible region 3=24030
- recording spectrophotometer for 40-1200 μ 3=14351
- scanning and integrating instrument for small
objects 3=9595
- for spectrochemical analysis Al alloys, multichannel,
photoelectric, performance. 3=25850
- for spectrochemical analysis, alloys, U.S.S.R., U.K.,
U.S.A., performance. 3=25848

Spectrophotometers—contd

- for spectrochemical analysis, steel, multichannel, photoelectric, performance. 3=25849
- spectrofluorimeter, double beam 3=3880
- for thermoluminescence, alkali halides, rapid scanning, automatic 3=18992
- u.v. recording micro, 220v-7000 Å, for tissue cell absorpt. 3=14349
- u.v.-visible, photometric standard 3=1816
- ultra-violet vacuum, conversion to visible, density recording 3=18993
- for vacuum u.v. region 3=18994

Spectrophotometry

See also Colorimetry.

- absorption, cryostat for -194° to -40°C 3=9651
- association const. det. of charge-transfer complexes 3=2674
- astronomical, standards 3=16316
- background correction 3=11914
- flames, absorpt. meas., signal-to-noise ratio 3=21548
- i.r., near, transmission scale calibrating method by rotating sectors 3=249
- immersion of interference films 3=11917
- intensity calibration, absolute, in vac. u.v. 3=16767
- infrared band profiles, statistical analysis 3=14344
- liquids, opaque, using multiple attenuation total reflection 3=18989
- use of Michelson interferometer in near i.r. 3=16769
- microspectrophotometry, biological appl. 3=24024
- noise, filtering 3=11913
- use of oscillating Fabry-Perot interferometer 3=16768
- P cygnus type stars 3=11571
- review of three main accurate methods 3=16728
- solar extreme u.v., photoelec. study 3=9198
- u.v.-visible, photometric standard 3=1816
- using multiple attenuation total reflection, liquids, opaque 3=18989
- CaF₂ plates, i.r. transmission 3=10942

Spectroscopy

See also Spectra; Spectrometers; Spectrophotometry.

- absorbance along atmosph. slant paths 3=14339
- absorption spectra, derivative recording, resolution 3=16766
- atmospheric emissions, upper, technique 3=3509
- atomic and molecular applications, conference, Gor'ki, 1961 3=18961
- atomic, review 3=19916
- atomic, wavelength meas. using photoelectric scanner and Moiré fringes 3=698
- bandwidth and coherence time measures 3=233
- blackening behaviour of background affected spectral lines on plates 3=7343
- complex spectra, det. of line intensities, positions 3=5516
- condensed medium, absorption, observed—true relationship 3=18986
- conference, Maryland (1962), report 3=3876
- conference (10th internat. colloquium), Maryland (June, 1962) 3=247
- correction of spectral profiles, derivation method 3=7323
- correction of spectral profiles for dispersion 3=7324
- crystal thin section prep. by ultramicrotome for absorption spectroscopy 3=13978
- discharges, elec., investigations rel. to microwave and probe methods 3=4030
- dispersion meas. in i.r. gas absorption bands 3=14345
- emission spectra, time-resolved, recording methods, limiting sensitivity 3=14342
- excitation modulation, vibr. spectra of mols. 3=12802
- far i.r., specimen prepn. techniques 3=3879
- fine structure constant, non-dimensional nature 3=16486
- flame photometers, pneumatic annular atomizers 3=21549
- Fourier, apodization 3=9612
- Fourier spectrometry, instrumental function for discrete analysis 3=18987
- Fourier transfor, "mock" interferometry 3=16771
- Fraunhofer lines, polarization, photoelec. meas. 3=270
- furnace, for low-volatile substances 3=1817
- gases, i.r. bands, integr. intensity and line widths, meas. method 3=7248
- gratings and echelles, tandem use 3=5519

Spectroscopy—contd

- i.r. atomic emission spectra, extraphotographic, obs. 3=18983
- i.r. low temp. cell for liquids 3=1693
- i.r. 1-5 μ , precision, review, 3=248
- image intensification by anamorphic optics 3=18985
- intensity calibration, absolute, in vac. u.v. 3=16767
- interference, detector noise effects 3=250
- interference patterns, superposition method 3=14343
- interferometers, compensated field, for Fourier transforms 3=21540
- kinetic absorption spectra recording 3=18982
- line distortion, by photoelectric recording 3=14341
- line profile time evolution, device 3=7326
- lines in populous spectrum, interferometric wavelength measurement 3=11924
- molecular dipole meas. in solutions 3=2604
- moving specimen intensity modulation for improved sensitivity and accuracy 3=21551
- objective for 3-prism stellar spectrograph 3=11884
- one-angle reflection, optical constant determination 3=21517
- optical cell for chem. corrosive solns. 3=7333
- and optics, Conference, Jena 1960 3=11875
- particle size effect on i.r. absorpt. 3=14346
- by photocell, proposal 3=5520
- photographic films, visible and i.r. sensitivity 3=9631
- plasma density and temp. meas. 3=7577
- plasma electron temp. meas. with "Alpha" appar. 3=24303
- plasma, highly-dense; short-time, methods 3=7580
- plasmas, high-density corrections 3=1961
- plasmas, high-temp. collision-dominated 3=7506
- plasmas, meas. of temp. and density 3=9806
- plasmas, non-thermal, problems 3=7504
- polychromator for time-depend. line profiles 3=7346
- Raman, advances and appl. 3=5517
- Raman, intensities and depolarization, effect of illumination geometry 3=7332
- reflectance change at const. wavelength 3=16777
- sensitivity gain enhanced by Fourier spectrometry 3=1815
- Shannon approx. calc. of true shape of spectra 3=3878
- shock-excited powdered solids 3=24018
- solid state emission, 50-1000 Å, accurate recording 3=11918
- solid-state spectra, for appl. to lasers 3=7330
- spectralcinematographical methods, development 3=7327
- spectral time scans, using Fabry-Perot etalon and electron-optical intensifier 3=24036
- spectropolarimetry, instrument problems 3=16806
- sum rules, including induced emission effects 3=7331
- time resolved, new high precision system 3=1813
- u.v., extreme, history and review 3=14337
- vacuum u.v. radiation physics, conference 3=5515
- vacuum u.v., wavelength standards and order separation 3=7329
- vacuum ultraviolet, recent advances 3=7325
- wavelength meas., concave grating spectrograph 3=18984
- wavelength meas., quantum limit 3=14304
- wavelength meas. in vacuum u.v., review 3=21538
- Pt reflecting films for vacuum u.v. 3=19005

Light sources

- arc, high-voltage with perforated anode 3=19000
- atomic line spectra in vacuum u.v., review 3=21538
- Balmer light, intensity modulation 3=21555
- chopper, electronic 3=21554
- continuous, below 500 Å 3=9592
- electrodeless discharge lamps 3=18998
- electrodeless, high intensity, for Raman spectroscopy 3=7350
- flames, temp. meas., by spectral lines of alkali metals 3=16829
- flames, temp. meas., from alkali indicator partial pressure 3=19051
- flash sources, continuous, energy distrib. 3=4047
- high-temp. arc jet 3=24259
- Houtermans, Carlo-Lochte-Holtgreven, and cataphoresis lamps, interferogram comparison 3=256
- for infrared spectrometer 3=24038
- jet-controlled arc, second spectra excit. 3=16783
- lasers, Conference, Great Malvern 1963 3=24039
- microwave line source for vacuum u.v. 3=11922
- Penning discharge, extreme u.v. 3=7348

Spectroscopy — contd**light sources — contd**

- plasma jet, line intensity fluct. small 3=1820
- Raman, use of ruby laser 3=7347
- secondary standard, ribbon lamp, 2450-26000 Å 3=253
- single-discharge emission, time-intensity reln. 3=5522
- solar spectrum simulation with Xe lamp 3=5523
- spark, electric, time resolved, for atomic absorption 3=11923
- u.v., all-metal, arc, l.p. 3=21533
- u.v., extreme, two sources 3=14355
- u.v., far, quartz l.p. H lamp 3=21556
- u.v., vacuum, two discharge sources 3=7349
- vacuum u.v. 3=7329
- vacuum u.v., inert gas continua 3=7462
- vacuum u.v., low inductance sliding spark 3=11921
- vacuum ultraviolet, Cornell 3=10964
- Van de Graaff beam passed through foil and imaged on Raman spectrograph 3=19918
- He continuum for photoelec. scanning, 600-1100 Å 3=16782
- Hg discharge lamp, spectral line intensity ratios, 1 to 400 torr 3=255
- He lamp, low-voltage, Raman spectra excit. 3=1821
- Hg vapour lamp, for Raman spectra, of solids 3=5524
- U tetrachloride and tetraiodide lamps 3=18999
- Xe resonance lamp 3=24040

Spectroscopy, radiofrequency

See also Nuclear magnetic resonance and relaxation:
Paramagnetic resonance and relaxation; Spectrometers,
radiofrequency.

- Ampere Colloquium, Eindhoven (1962) 3=20629
- Ampere Colloquium, Leipzig (1961) 3=23198
- cavities, high Q, dynamic investig. method 3=5885
- double resonance in the rotating frame 3=6761
- dynamic polarization and resonance signal detection by double irradiation 3=21982
- ellipticity analyser using transition turnstile 3=19467
- frequency standards, lab. installation 3=19465
- integrator, long-period, for e.s.r. spectrometer 3=5609
- klystron stabilizer, 10 kc/s Pound-type 3=14765
- microwave, review 3=21981
- radioelectric method for dielec. props. 3=3838
- relative intensity meas. 3=22000
- signal-to-noise ratio enhancement 3=19473
- spectral line shape theory 3=19466

Speech

See also Hearing.

- amplitude clipping 3=13944
- analysis, computer technique 3=9291
- analysis—synthesis, using orthog. exponentially damped sinusoids 3=13947
- articulation index calc. and use in intelligibility testing 3=3651
- articulation index, use in speech distortion, noise masking 3=3652
- channel-vocoder, spectral distortion, pitch-induced 3=16444
- conversion into typed and translated form 3=1551
- display for visual perception 3=14283
- formant-frequency extraction 3=25998
- formant freqn. extraction by moment calc. 3=13948
- frequency spectrum intensities display 3=1779
- fundamental periodicity, normal and pathologic larynges 3=11621
- intelligibility, audio-noise-reduction circuit 3=9289
- intelligibility in auditoria 3=23990
- intelligibility, signal and context components 3=16443
- interference by noises aboard ship 3=25996
- interference, classification of noises 3=25997
- interrupted, communication efficiency 3=11622
- loudness, sound press. and subglottal press. relationships 3=13945
- masking signal, intelligibility 3=11623
- muscle action in speaking /f/ 3=13946
- nasal consonants, analysis 3=7064
- perception, word-frequency effect 3=9290
- pitch extraction by computer processing 3=11620
- processed, articulation effectiveness measure 3=21154
- role of acoustics in artistic work 3=16712
- spectrographic pictures prodn. 3=21153
- spoken English, statistics 3=18670

Speech — contd

- synthetic, use in auditory correction 3=3682
- time-frequency-energy patterns 3=11624
- vocal-tract formant freqs. and bandwidths meas. 3=21152
- voice-excited vocoder simulated by digital computer 3=25999
- voiceprint identification 3=9292

Spin

See Fundamental particles; Hyperons, spin and parity; Mesons, spin and parity; Nucleus, spin and parity; Rotating bodies.

Spinors

See Quantum theory, wave equations.

Sprays

See also Aerosols; Drops; Jets.

No entries this year

Sputtering

- adhesion, greater than evaporation, mechanism 3=23505
- arc electrode material emission mechanism 3=24252
- cathode, in hollow discharge 3=377
- cathode, on to large areas 3=14682
- cathode, oxide, by low-pressure discharge, rel. to temp. and geometry 3=7654
- cathode, radioactive sources prodn. 3=19801
- cathode, spectrum, from ions dislodged by sputtered atoms from auxiliary target 3=12258
- dielectrics, use of h.f. fields 3=450
- in discharges, electric, high-pressure, of electrodes 3=14533
- elec. discharge erosive characteristics 3=24251
- electrodes, glow discharge in mag. field 3=9750
- electron emission microscope, by ions 3=14642
- ferromagnetic thin films, preparation 3=8674
- glow discharge, rel. to current 3=4213
- high-energy, theory, rel. to focused collision sequences 3=4212
- ion pump leak detectors, sensitivity 3=1742
- ion source, for solids analysis 3=21894
- metal crystalline spheres, by Kr ions from 1 to 10 keV 3=2051
- metallic surface, mechanism 3=24372
- metals, b.c.c., spatial distrib. of atom ejected from single crystals 3=10704
- metals, of Cu, hollow-cathode Ar discharge 3=16988
- metals and semiconductors, using 1-5 keV Ar⁺ ions 3=9877
- metals, by U²³⁵ fission fragments 3=8152
- metals, yield, by Ar⁺ ions, medium energy 3=14679
- meteorites, by 20 keV Ar ions rel. to space erosion 3=1516
- neutral particles and ions, independent analysis 3=24389
- oxide layers, mixed, deposition 3=2050
- Penning discharge ions, patterns 3=7453
- Permalloy films, rel. to structure and magnetic anisotropy 3=15819
- plasma, r.f. method 3=6883
- pulse, in inert-gas glow discharges 3=24243
- review 3=7653
- single crystals, rel. to incident particle directions 3=19374
- surface cleaning efficiency 3=4203
- velo. meas., atoms, time of flight 3=14681
- yield meas. 3=14679
- Ar⁺, on 16 metals, full-plane threshold energies 3=22875
- Ag by Ar⁺ ions, 10-200 keV 3=7655
- Ag films, inside electron microscope 3=451
- Al, by Ar⁺, 1-2 MeV; preferential ejection 3=7656
- Al monocrystal, atomic ejection sequences by Ar⁺ bombardment, 50 keV 3=2845
- Al, by Zr ions, ~ 10 keV 3=4219
- Ar, re-emission of sorbed Ar 3=9518
- Au, by Ar⁺ ions, directional ejection, effect of thermal motion 3=452
- Au, energy spectrum, rel. to thermal spikes investig. 3=8421
- Au films, by inert gas ions meas. 3=10707
- Au targets, low-energy yield, guarding effects 3=22876
- Cu, angular dependence for single crystals 3=10705
- Cu, Ar⁺-ion bombardment, 25-75 keV, focused recoil trajectories 3=2049
- Cu by Ar⁺ ions, 10-200 keV 3=7655
- Cu by Ar⁺, 1-2 MeV; preferential ejection 3=7656
- Cu, by H ions 3=4218

Sputtering—contd

- Cu, by Ne^+ , Ar^+ , Cu^+ ions, 5–20 keV 3=4217
 Cu, by Sn, Zr and Mg ions, ~ 10 keV 3=4219
 Cu, cathode, particle vel. meas., rel. to focusing energies 3=25315
 Cu crystals, by Ne^+ , Ar^+ , Kr^+ , Xe^+ ions, 100–1000 eV 3=4216
 Cu, rel. to directions of incident Ar particles 3=19374
 Cu, on metals, hollow-cathode Ar discharge 3=16988
 Cu, (100) faces, by 15–30 keV Ar^+ , Ne^+ ions 3=13020
 Cu (100) surface, by 27 keV Ar^+ ions 3=10703
 Cu, (100) and (111) faces deposit patterns 3=15522
 Cu₂O, films, deposition by sputtering of Cu in Ar and O 3=16138
 Cu₂O, films, growth structure, by electron diff. 3=16139
 Fe polycrystalline spheres, by Ne^+ , Ar^+ , Kr^+ , Xe^+ ions, 100–1000 eV 3=4216
 Ge, deposit patterns 3=22877
 Ge surfaces, hillocks 3=24386
 KCl, low-energy, K atom ang. distrib. 3=4215
 Mo, by Cs^+ , spectrum, from ions dislodged by sputtered atoms from auxiliary target 3=12258
 Mo polycrystalline spheres, by Ne^+ , Ar^+ , Kr^+ , Xe^+ ions, 100–1000 eV 3=4216
 Ni, (100) faces, by 15–30 keV Ar^+ , Ne^+ ions 3=13020
 Ni polycrystalline spheres, by Ne^+ , Ar^+ , Kr^+ , Xe^+ ions, 100–1000 eV 3=4216
 Pb, by Ar^+ , 1.2 MeV; preferential ejection 3=7656
 SiC by positive ions 3=4214
 Ti by D ions, 10 to 25 keV 3=449
 W, effect of ambient gas at high temp. 3=14680
 W, surface vacancies, after α -irrad. 3=17775
 Zn, deposit patterns 3=22877
 Zn, by Ar^+ , 1.2 MeV; preferential ejection 3=7656

Standards

- See also Constants; Units.
 atomic spectrum oscillator strengths 3=22470
 atomic time scale 3=11750
 beam frequency, choice of molecule 3=12882
 β and γ ray source, Co^{60} for coincidence meas. 3=7822
 brightness, candela, reproduction by secondary standard tungsten filament lamps 3=9317
 dielectric at microwave frequency 3=13103
 e.m.f., NBS standard volt box 3=14472
 frequency, Cs beam, operation and improvements 3=13992
 frequency, N^{15}H_3 double-beam maser as primary 3=12346
 frequency, quartz-controlled, lab. installation 3=19465
 frequency, Rb vapour, optically pumped 3=13991
 frequency standards, use of solid-state masers 3=9989
 frequency, Tl^{205} atomic beam 3=13990
 frequency, use of N^{14}H_3 maser on 3, 2 line 3=519
 frequency, using resonance inversion line 3=5031
 frequency, using Cs beam resonators, direct and servo methods, comparison 3=11749
 length and temperature, new 3=9315
 length, line standards, interferometric comparison 3=13988
 light, international, reproducibility 3=3701
 mass, accuracy of British kilogramme 3=21188
 neutron flux, thermal, calibration 3=19651
 radiation, C arc, visible and i.r. 3=21539
 reflectance, 0.3–2.6 μ , MgO surface 3=1786
 temperature, Bi, high-purity, freezing pt. 3=9642
 temperature, ice point, thermoelectrically maintained for thermocouples 3=19050
 temperature, international, role of Pt resist. thermometer 3=21598
 thermal conductivity, Pt for high temp. 3=25216
 time, comparison between N.P.L. and L.S.R.H. 3=9318
 voltage, high-frequency; by wire bolometer and thermistor bridge 3=344
 wavelength calibr. in 30–1000 μ 3=24019
 wavelength in vacuum u.v. 3=13989
 wavelength, i.r. precision spectroscopy 3=248
 wavelength, NBS programme 3=9591
 wavelengths in vacuum u.v., review 3=21538
 wavelengths of Kr^{86} , Hg^{100} , Cd^{114} , secondary standards 3=12763
 S, i.r. reflectance standard 3=11882

Stark effect

- asymmetric-top rotator 3=8231
 methyl fluoride 3=17601
 paramag. crystals, energy level splitting, rel. to spin–lattice relaxation 3=3182
 in plasma, heavy-element isolated lines 3=701
 spark discharge spectra, ion concn. time variation 3=2553
 symmetric-top molecules, Stark energy levels 3=17564
 for voltage measurement 3=12041
 $\text{F}_2\text{HC}-\text{CDHF}$, 7–25 kMc/s 3=17593
 H, electron excitation, cross-sections 3=25044
 in H, spectra, plasma line asymmetry 3=12753
 HF 3=19984
 Na arc jet, direct current, 4982.8 Å line broadening 3=9757
 S, in ionic gaseous H_2S and crystalline CaSO_4 , X-ray K absorpt. spectrum and excitons 3=23097

Stars

- See also Nebulae; Novae; Sun.
 absolute magnitude detm. by Ohman's method 3=13899
 acoustic noise generation in turbulent atmosphere 3=11540
 AGK2 and AGK3 measurements 3=7005
 astrometry symposium 3=7004
 astrometry with large reflectors 3=7008
 atmosphere, stationary shock wave propag. 3=5263
 atmospheres, non-grey, model 3=1530
 atmospheres, rate of collisional excitation 3=3597
 atmospheres, resonance radiation diffusion 3=9240
 atmospheres, reson. radiation diffusion 3=16403
 atmospheres, shock wave decay theory 3=9235
 atmospheres, temp. distribution 3=13904-5
 binary, visual, orbit calculation, by digital computer 3=5261
 blue, high galactic latitude, mean absolute magnitude 3=7034
 cepheids, rel. to Galactic structure and rotation 3=9246
 circumpolar, calc. of apparent posns. 3=13898
 clusters, expansion, virial theorem appl. 3=18591
 clusters, globular, dia.—magnitude—distance—absorpt. relation 3=23701
 clusters, globular, distrib., det. of distance to galactic centre 3=7038
 clusters, globular, limiting radius for stability against galactic forces 3=11581
 clusters, globular, structure 3=16416
 clusters, globular, variable stars 3=16415
 clusters, n-body problem, numerical integr. 3=9244
 clusters, open, luminosity comparison 3=9243
 clusters, open star, classification 3=11579
 clusters, role of escape, two populations of different masses 3=16413
 clusters, spherical, in quasistationary state 3=16412
 clusters, young, search for late-type stars 3=11575
 collapse, gravitational, after energy-source exhaustion 3=6149
 colour—magnitude diagram, high vel. stars 3=3600
 colours and luminosities, rel. to interstellar reddening 3=13897
 "cosmic cycles" theory, constancy of no. of stars 3=5267
 δ Cephei, velocity and light curve phase relationship 3=13910
 double, mass rel. to ang. momentum 3=11585
 double, measures of 552 3=11551
 double, orbital evolution 3=13852
 double, orbit calculations 3=13801
 double stars, measures of 313 3=11552
 dynamics, spherical galaxies 3=11580
 early-type, distrib. in Galaxy 3=11578
 early-type, radial vel. from galactic centre 3=13901
 eclipsing, ephemerides calc. 3=16394
 electron density—electron temp. relns. 3=9245
 equatorial, catalogue for equinox 1950.0 (TME) 3=9227
 evolution, neutrino emission processes 3=10085
 evolution, review 3=21114
 exploding stars, review 3=1525
 flares and radio emission (240 Mc/s), red dwarf 3=18659
 formation in elliptical galaxies, role of turbulence 3=9248

Stars—contd

- formation in expanding universe 3=16323
- formation in globular clusters, random fragmentation 3=1535
- formation from interstellar dust by radiation pressure 3=3536
- galactic clusters, mass-function 3=16325
- galactic clusters, space distrib. rel. to age 3=11584
- giant, energy transport in H ionization zone 3=3596
- halo, gas motion, intergalactic matter role 3=16327
- inhomogeneous atmosphere, shock wave propag. 3=3602
- ionization equilibrium eqn. of state 3=16401
- ionization—equilibrium eqn. of state 3=3589-90
- late main-sequence, colours and spectra, relationship 3=3595
- massive, model, including Kramers' opacity 3=11558
- motion in the Galaxy 3=11554
- motion perpendicular to galactic plane 3=9251
- motions, proper, computation and improvement 3=3584
- neutrino emission, in late C-burning phases 3=13896
- neutrino emission, $\gamma + \gamma \rightarrow \gamma + \nu + \bar{\nu}$ process 3=24689
- neutron-capture reactions 3=1532
- O-type, absolute magnitudes 3=18642
- observations 1959-60, conference 3=9139
- open clusters, proper motions 3=7007
- photometry of very faint stars 3=16317
- photometry, 3-colour, of giants and supergiants 3=9225
- photometry, three-colour, of two star-fields 3=9253
- planetary nebulae, thermal equil. 3=1536
- radiation intensity increase before exit of shock wave 3=9228
- radio emission (240 Mc/s) and flares, red dwarf 3=18659
- rate of formation, rel. to mass 3=18640
- reference stars, international programmes 3=7006
- rotating, toroidal magnetic field, thermal generation 3=3585
- rotation instability, theory 3=9234
- rotation, retardation due to light and corpuscular radiation 3=23691
- RR Lyrae variables, photographic magnitude 3=7038
- "run-away", origin 3=7035
- shock-wave propagation 3=23692
- shock waves, front-to-back ratios 3=23690
- southern zone catalogues, present work 3=9226
- space distrib. for spectral types F2-G5 3=13913
- spherical systems, high-energy stars, distrib. 3=9247
- star-gas dynamics, cooperative phenom. 3=13914
- systems, polytropic gas spheres model 3=1524
- temperature, by electric discharge theory 3=16405-6
- thermonuclear reactions up to Fe formation 3=9232
- 3C 273, classification 3=13900
- variable, long-period, theory 3=16399
- vel., tangential, 1319 stars in 19 selected areas 3=11555
- velocity distrib., of spectral types O to B₉ 3=9231
- weak, rotation in Galaxy 3=11582
- white dwarfs, atmosphere models 3=11573
- white dwarfs, effective temp. and surface grav. 3=11560
- white dwarfs in galactic clusters, test of variation in gravitational const. 3=5336
- zeta Aurigae-type, late-type component, atmosph. 3=9237
- CNO bi-cycle, mean lifetimes 3=3588
- D(p, γ)He³ reaction, below 50 keV 3=15045
- H α -emission, rel. to type II supernova remnants 3=9242
- He-burning reactions, $1-6 \times 10^8$ °K 3=1531
- He-star models, massive, homog. 3=16398

composition

- See also Elements, origin
- $\gamma + p \rightarrow n + \nu + e^+$ process 3=23693
- isotopic synthesis by neutron capture 3=21113
- magnetic stars, surface 3=11564
- metal abundance, high, Fe, Sr 3=18641
- metals, deficiency in population II 3=13908
- Mira type variables, metal deficiency 3=11567
- 63 Tau, atmosphere, metals abundance 3=16404
- white dwarfs, atmospheres, theory 3=5265
- H₂, detection, by Σ continuum, and temp., B stars 3=16407
- He-burning reaction products, energy prod. 3=11563

Stars — contd

composition — contd

- Li abundance, gravitationally contracting stars 3=11562
- Li and He³ formation by accelerated particles 3=21087

magnetism

- See also Sun, magnetism.
- dynamo theory, expt. test 3=18566
- rotating mag. stars, steady meridian circulation 3=21115
- and solar system origin, with nearby approach 3=18596

radiation

- See also Cosmic radiations, radiofrequency; Sun, radiation.
- absorption, total to selective ratio, var. with galactic longitude 3=11553
- B8, B9 type, U, B, V, H β photometry, 501 stars 3=11561
- B stars, radiation below 2400 Å, boundary conditions 3=3601
- binary systems, light curves 3=13906
- blended lines, non-coherent scatt. function 3=1529
- Cassiopeia, 45 Mc/s, study of ionospheric drifts 3=3493
- Centaurus A, central component polarization 3=7052
- cepheids, short-period, luminosity 3=11572
- cosmic rays, He³ abundance 3=6099
- eclipsing variables in galactic clusters, list 3=18639
- filtered, bandwidth, effects on detected energy 3=18585
- interstellar polariz. rel. to wavelength 3=13855
- interstellar radiation field 3=1527
- luminosity rel. to neutrino-pair production from photons 3=2232
- mass-luminosity relationship 3=16410
- neutrino pair emission by hot plasma, calc. 3=7824
- neutrinos 3=577
- photometric systems correl. 3=16393
- polarization by paramag. particles 3=1508
- Rayleigh scattering by molecular H 3=3587
- and rotation retardation 3=23691
- scattering by electrons, relativistic, and high energy photons prod. ? 3=19723
- T Tauri, H atoms excited by synchr. radiation 3=11569-70
- transfer, numerical approximations 3=21266
- u.v. quanta, det. from gaseous nebula absorpt. 3=3612
- u.v. to visible ratio, 40 O, B, A stars 3=11481

spectra

- absorption, bands, due to metallic particles 3=13909
- with atmospheres, extensive 3=21117
- B stars, u.v. continuum, H atom mechanism 3=9236
- B-type stars, H-line intensities rel. to rot. vels. 3=9241
- binaries, visual, mass-luminosity relations 3=16409
- C II, N III, O IV, lower levels, statist. equil. 3=21116
- Cepheids, reversing layer, absorption lines 3=9238
- CN anomaly and U,V,W components of space vel. 3=7037
- continuum intensity meas. for advanced type 3=9239
- energy distrib. in 18 stars 3=16316
- extreme u.v., from space vehicles, review 3=14337
- Fraunhofer lines, Doppler widths, empirical inference 3=9222
- H, discontinuities, mean optical depth of formation and series limit line strength 3=25041
- intensity of λ 4430 and colour excess 3=16400
- i.r., 8248-8321 Å, carbon stars 3=16408
- lines, calc., weighting function method generalization 3=23696
- M-type stars, absorpt. 3=11574
- Mira type variables, line weakening 3=11567
- non-hydrogenic atomic system, continuous absorption coeffs. 3=3599
- α Orionis, 10 μ radiation measurements 3=13903
- P cygnus type, temps., spectrophotometry 3=11571
- 63 Tau, metallic-line spectrum 3=16404
- Σ continuum, H₂ detection, and temp., B stars 3=16407
- T Tauri, radiation from H atoms, theory 3=11569-70
- 3C 273, absolute energy distribution 3=13907
- turbulence 3=18643
- Wolf-Rayet, emission line profile analysis 3=23695
- Fe II, gf values 3=9201

structure

- atmosphere, equilibrium 3=1659
- atmosphere, flux constancy required for given max. temp. var. 3=23694
- convective envelopes, differential rotatn. 3=11565
- early type, H II region, formation 3=11556

Stars—contd**structure—contd**

- electron atmosph., optical thickness from Compton shift 3=5264
- electron distrib., effect on Be⁷ electron capture rate 3=2404
- 5-solar masses, He-burning to H-burning transition 3=3594
- gravitationally contracting, of one solar mass 3=11562
- long-period variables, luminosity 3=3598
- M-type stars, atmospheres 3=11574
- multiple frequencies and beats in B Canis Majoris 3=3593
- neutron core stability in gen. relativity theory 3=7036
- neutron cores, detection 3=16402
- oscillations and stability of rotating gaseous masses 3=3591-2
- pure He stars, equilb. models 3=11557
- red giants, models 3=16395
- red giants, neutrino processes 3=13902
- rotating mag. stars, steady meridian circulation 3=21115
- subdwarfs, internal structure, C content 3=1526
- superdense neutron configs., nonrelativ. theory 3=9233
- temperature, B stars, and H₂ detection, by $^3\Sigma$ continuum 3=16407
- variable, long period, model 3=5262
- very-low-mass stars, convective models and evolution 3=16396-7
- Be⁷ electron capture rate, nuclear matrix elements 3=2404
- C¹³ prod., and γ -ray width of 9.63 MeV level 3=11568
- C¹³/C¹² ratio, and C¹³(p, γ)N¹⁴, effect of possible N¹⁴ level \sim 7.60 MeV 3=11566
- Ne²⁰ prod., by O¹⁶(α , γ), and γ -ray width of 7.20 MeV Ne²⁰ level 3=11568

Statistical analysis

See also Measurement, errors; Probability; Random processes.

- disordered linear chain of N degrees of freedom, natural freqs. 3=21200
- energy levels of complex systems 3=14046-7
- extrapolation, reliability, over long periods 3=5327
- linear stochastic operators 3=14037
- linear systems, new treatment 3=14040
- linear systems with randomly varying parameters 3=16492
- radial distrib. functions from integral eqns. and Monte Carlo 3=1656
- random matrix diagonalization, numerical calc. 3=21201
- random placement on linear lattice 3=9357
- random variable regression and correlation theorems 3=5326
- random walk on lattice, number of sites visited 3=23775
- white-noise probing, parameter identification 3=11671

applications

- best fit line 3=21202
- compound-nucleus level-density fluctuations 3=24855
- crystal structure intensities 3=23430
- exponential absorpt., n obs., optimum design of expts. 3=5328
- lattice models, 2- and 3-dimensional, excluded vol. effect 3=16544
- life times, short, meas. with background 3=24669
- linear distributed systems, first order 3=16538
- macromolecular configurations, Monte Carlo study 3=15400
- micromeritics, statistical technique 3=6934
- multiple scattering, correction for energy losses 3=24667
- neutron flux at a point, Monte Carlo estimation 3=24739
- neutron time-dependent thermalization problem 3=24738
- neutrons and precursors in multiplying medium, probability distrib. 3=25002
- non-Gaussian character of real polymer chains 3=10558
- photoneutron multiplicity meas. 3=10330
- polymer chains, new Monte Carlo method 3=12887
- polymer molecules with solvent interaction 3=10562
- polymer systems, stochastic processes 3=8320
- radiation scattering, statistical geometric bases 3=14041
- radii of gyration for random flight chains 3=15403

Statistical analysis — contd**applications — contd**

- radio wave propag. data, theory 3=502
- resonance states of particles 3=24671
- semiconductors, negative temps. 3=17839
- spark counters, multiwire, accuracy track location 3=24543

applications, counters

- angular correl. attenuation coeffs. 3=19512
- angular correl. data analysis 3=12377
- correlation function for dead-time 3=14832
- dead-time corrections for short-lived nuclides 3=17119
- generating functions of probab. theory 3=14833
- lifetimes meas., delayed coincidences analysis 3=2384
- parameters det. from grouped samples 3=530
- pulse series analysis, time selector 3=1918
- registrations number, distributions 3=14811
- scintillation, using internal standards, error eqns. 3=22039
- simultaneous meas. for several spectra 3=1922
- width, channel, optimum, single-channel analyser 3=19513

Statistical mechanics

- adsorption of monolayer on square lattice 3=3367
- antiferromagnetics, quantum statistics 3=5027
- antiferromagnetics, quantum theory 3=8693
- asymptotic behaviour of perturb. expansions 3=7141
- asymptotic form of structure function for real systems 3=11712
- Boltzmann eqn. for conduction electrons 3=25227
- Boltzmann eqn., generalization to general order in the density 3=56
- Boltzmann eqn., relaxation time of conduction electrons in noble metals 3=25228
- Born series convergence, bound states 3=21248
- Bose gas, free, nonrelativ., canonical commut. relns. 3=14056
- Bose gas, ground state energy, simple calc. 3=16552
- Bose gas, interacting, exact analysis 3=14064
- Bose gas, interacting, excitation spectrum 3=14065
- Bose system, chem. potential and low-lying excitation 3=18752
- Bose system, N-body, with finite states number 3=11724
- bosons and fermions with negative energies 3=5389
- boson gas, Bose-Einstein condens. order 3=18751
- boson gas, hard-sphere, with weak potential 3=21264
- boson gas, nonideal, pair Hamiltonian model 3=78
- bosons, hard-core, pseudospin model with attractive interact. 3=23803
- bosons, interacting, Green functions and self-energy parts 3=11725
- bosons, interacting, ground state and sound velocity 3=23802
- bosons, interacting system, low-lying states 3=79
- bosons, point-particle, one-dim. gas 3=14057
- bosons, quantum cell model 3=5388
- bosons, rel. to ferromag. spin waves 3=13234
- bosons, weakly interact., superfluidity 3=11729
- cellular method calc. for fluids 3=21292
- chain, "almost one-dimensional," quantum mechanics 3=23773
- charged-particle collisions, collision integral 3=4354
- charged particle system, equation of state, classical, high temp., low density 3=21258
- chromatography, stochastic theory 3=8963
- classical distrib. of mutually interact. system of particles 3=9358
- classical, for two-body potential 3=11708
- classical system, 12 degrees of freedom 3=21204
- classical systems, Green's and distribution functions 3=1620
- cluster expansion methods for systems of polar molecules 3=10552
- cluster expns., equilb. distrib. functions 3=58
- cluster expns., non-equilb. distrib. functions 3=57
- collective motion of particles at finite temp. 3=7140
- collision integral for charged particle system 3=3770
- composite-particles system, second quantization represent. 3=21257

Statistical mechanics — contd

- condensation theory, critical pt. and metastable state 3=21634
- condensation, Yang-Lee theory 3=7393
- condensed systems, functional method 3=14054
- conference, Onsager, Providence (1962) 3=7131
- correlated interacting subsystems 3=7138
- correlated systems, entropy 3=11707
- correlated systems, time-independent distrib. 3=18740
- coupled oscillators, nonlinear, perturb. theory 3=11714
- creation and annihil. operators, invariant functions 3=9363
- cross-relaxation in spin systems, quantum statistical theory 3=5372
- crystal, harmonic, dynamics, isotopic defects 3=20076
- crystal lattice, dipolar interactions 3=10575
- crystal lattices, review and exact isotherm 3=12910
- crystals, weak-coupling rate eqns. 3=12935
- diagram techniques, Bose-Einstein gas, degenerate rate 3=18753
- diamond, Ising model 3=12898
- dielectric formulation for general interact. 3=14051
- dielectric function for classical system 3=16549
- dielectric relaxation in high-temp. dipole lattice 3=16543
- dipole assembly on vibrating lattice, equil. approach 3=2715
- dipole-dipole interact., short range 3=8542
- e.m. wave, ensemble-average, in irreg. gases 3=17048
- electron gas, free energy, rel. to magnetism 3=3769
- electron gas, i.r. divergencies 3=7149
- electron-phonon system, elec. conductivity 3=6468
- electrons, transverse conductivity, zero-freq. limit 3=4848
- energy levels of complex systems 3=14046-7
- ensemble theory, classical, functional averaging method 3=5370
- entropy, system of almost indistinguishable components 3=18738
- and equations of state, theoretical survey 3=20116
- eqn. of state of one-dimensional system with attractive potential 3=65
- equilibrium, rel. to one- and two-particle densities 3=62
- ergodic theories, conference 3=55
- exchange coupling, generalized 3=16547
- excitons, Bose-Einstein condensation in CdS and CdSe 3=6498
- Fermi-Dirac gas, heuristic approx. 3=7143
- Fermi-Dirac system, two-particle bound states 3=1629
- Fermi-Dirac systems, non-ideal, field equations 3=5377
- Fermi fluids, Landau theory, quasi-particle assembly 3=23798
- Fermi gas, random fields, and electrons in glasses and inorganic polymers 3=20918
- Fermi system, collective excitation with non-zero ang. mom. pairing 3=5383
- fermion density formula, one-dimensional 3=14055
- fermion operator, general, second quantiz. 3=9372
- fermion system with attractive interact., two-particle approx. 3=7148
- fermion system, normal, static responses, Sampson-Seitz procedures 3=5387
- fermion system, pairing correl. theory 3=11727
- fermion system, self-bound, density propagator 3=9369
- fermion systems, interacting, t-matrix singularity 3=75
- fermion systems, stability conditions 3=18750
- fermions, gravitational interaction 3=14068
- fermions, quasi-particle approx. 3=1638
- ferromagnetic, cubic anisotropic, free energy 3=18067
- ferromagnetic single-domain particles, ensemble 3=15762
- ferromagnetism, linked cluster expansions 3=6698
- ferromagnetism, spin wave theory, review 3=15766
- fluctuation compressibility theorem and pairing model 3=7136
- fluctuation law, distrib. of N particles among g cells 3=9359
- Fokker-Planck equation, soln. using Campbell's theorems 3=9373

Statistical mechanics — contd

- Fokker-Planck eqn., Laplace transform. of soln. 3=16491
- free energy of system with random elements 3=23778
- free fermions and bosons, linear response function 3=1628
- gas models, one- and quasi-one-dimensional 3=1631
- gas, spherical model, one-dim. phase transition 3=16554
- gases, harmonic oscill. vibr. contribs., tables 3=23926
- gases, irreversible processes 3=3827
- gases, irreversible processes 3=11710
- gases of parallel hard lines, squares and cubes 3=7145
- gases, real, theory, book 3=11816
- gases, transport coeffs., Kubo formulae validity 3=18850
- generalized master eqn., deriv. 3=71
- generalized oscillator operators, irreducible represent. 3=21253
- Green function poles, further note 3=1621
- harmonically coupled particles, heat flow 3=7132
- Hartree-Fock approx., thermal, stability 3=7144
- higher random-phase approximations 3=16553
- hypervirial relations, classical 3=21259
- identical particles, space-time correl. function 3=5382
- interacting particles, relativistic corrections 3=3760
- "intermediate", gas, ideal, thermodynamic props. 3=18741
- ion decomposition reactions and stability 3=19375
- irreversible process, new method 3=11720
- irreversible processes 3=2
- irreversible processes, general theories, review 3=21251
- irreversible processes, variation principle 3=16541
- Ising lattice, long-range order parameter 3=3249
- Ising lattice with 1st and 2nd interacts. 3=14044
- Ising lattices, soln. by Pfaffian method 3=16542
- Ising model, free energy, rel. to lattice gas pressure 3=16548
- Ising model, perpendicular susceptibility 3=8327
- Ising model series, coeffs., asympt. form 3=16546
- Ising model, two-dim., spin correlations 3=13239
- Ising problem, critical region thermodynamics 3=23777
- Ising systems with long-range forces, stochastic fields 3=23779
- kinetics of small systems 3=8964
- lattice gas, two-dimensional 3=66-7
- lattice, plane Ising-Onsager dipole, partition function 3=21252
- lattice point theory, generalized in hyperspace 3=3761
- lattice systems, grand canonical ensemble, Monte Carlo calc. 3=16545
- linear colloids, order-disorder theory 3=3416
- liquids, with molecular interaction 3=21314
- magnetic resonance for strong exchange interact. 3=23214
- many-boson systems, perturbation theory 3=3768
- many-body systems, perturb. theory techniques 3=1627
- many-body systems, trial wave-functions 3=14066
- many-boson systems, single and gen. condensation 3=1635
- many-fermion perturb. series, divergence 3=21262
- many-fermion system, exactly soluble model 3=23799
- many fermion system, zero-temp. props. 3=9370
- many-fermion systems, degenerate problems, perturb. theory 3=9364
- many-fermion systems, nonuniform, one-particle Green's function 3=5385
- many-particle systems, classical, theorems 3=3759
- many-particle systems, time Green functs., analytical props. 3=3765
- masers, quantum, radiation field 3=12356
- master eqn., generalized, t-matrix expansion 3=11732
- master eqn., with special transition probab. 3=11717
- mixture of particles, reduced distrib. function 3=14048
- model system, comparison with original perturbation theory, expectation values 3=18737
- multicomponent system, binary collision method 3=5379
- multicomponent systems, mol. Kerr effect 3=7249
- N-dimensional spherical volume, redetermination 3=3761
- Nernst heat theorem 3=1626
- non-equilib processes, criticism of Prigogine's work 3=5371
- nonequilibrium thermodynamics, homogeneous many-reaction system 3=23776
- nuclear matter, superfluidity 3=19742

Statistical mechanics — contd

- nucleation of vapour deposits 3=1873
- open systems in contact with thermal reservoirs 3=1625
- particles of proper mass, positive, negative, imaginary 3=7092
- particles which cannot exchange places 3=3763
- partition function, analytic props. w.r.t. Planck's const. 3=68
- Percus-Yevick eqn. based on Taylor series expansion 3=59
- perturbation theory for double-time Green functions 3=7142
- perturbed system, eigen-fuctions from Maxwell-Boltzmann density operator 3=7133
- phase transitions, conference 3=9356
- phenomenological matrices, diagonalization 3=23776
- plasma, fluctuations in 3=5653
- plasma, non-isothermal kinetics 3=7501
- plasma, "sheet", one-dim., elec. field 3=11713
- polar media, interactions 3=23894
- polarons, Boltzmann eqn. 3=12951
- polymer solns., 2nd virial coeff. of branched star molecules 3=1686
- proper self-energy function, asympt. form 3=14049
- quantum and classical mechanics, correl. 3=21239
- quantum, ang. momentum transport eqns. 3=7139
- quantum, approach to equil. 3=11718
- quantum, density matrix representations 3=3762
- quantum gas, evolution eqn. soln. 3=9365
- quantum, Lippmann-Schwinger eqns. 3=21243
- quantum mechanical system, density matrices 3=18690
- quantum-mech. ring sum with Boltzmann statistics 3=5374
- quantum, partition function, numerical eval. 3=5376
- quantum, reduced density operators, generating functional 3=5375
- quantum, self-energy operator, perturb. theory 3=23786
- quantum statistical equil., evolution to 3=18743
- quantum systems, approach to equil. 3=23791
- quantum systems, dissipative, ergodicity 3=11716
- radial distrib. function, asymptotic behaviour 3=11722
- reduced density matrix for N particles 3=18749
- relativistic ideal gas, current vector and mass tensor 3=70
- relativistic ideal gas, current vector and mass tensor 3=1630
- relativistic particle kinematics, geometric soln. 3=9323
- relaxation processes, quantum theory 3=5373
- resonance, theory 3=21254
- response function, long-term behaviour 3=18742
- rigid-sphere mols., Boltzmann integral eqn. 3=14058
- self-avoiding walks on simple cubic lattice 3=23774
- self-consistent field and dielec. formulations 3=14050
- solids, Boltzmann transport eqn. 3=25226
- solids, Ising model, dimer statistics 3=14043
- solids, Ising model, time-dependent 3=14045
- spatially inhomogeneous systems with weak coupling, kinetic eqn. 3=11728
- spin and harmonic oscill. systems, relax. 3=7137
- spin operators, principle of entropy increase 3=61
- spin resonance saturation, steady-state soln. 3=5378
- spin system, mag. and acoust. excitation 3=11021
- steady-state processes, irreversible thermodynamics 3=64
- structured continua, ang. momentum and polarization 3=23781
- superfluidity, Landau criterion 3=9668
- surface tension rel. to curvature 3=14052
- system of weakly interacting particles; impulse excitation 3=5384
- thermodynamics, coiling-type molecules 3=15401
- thermodynamics, elements of, book 3=7134
- thermodynamics of nonuniform fluids 3=7135
- thermodynamics on quantum mechanics basis 3=11715
- thermodynamics, zeroth law 3=60
- translational inertial spin effect 3=3711
- transport phenomena in gases 3=9497
- transport phenomena, using BBGKY hierarchy 3=5380
- transport processes, diagrammatic calc. technique 3=5391
- transport processes, range of validity 3=7151

Statistical mechanics — contd

- variational, in terms of "observables" 3=11719
 - variational princ. and entropy prod. 3=23780
 - He³-He⁴ liquid mixtures, partition function method 3=19086
- Steam**
- spectra, emission, excited by protons and H atoms 3=15338
- Steel**
- adsorption, pulsed, stainless steel, high-vacuum gases 3=16147
 - austenite grain growth and boundary migration rates 3=23482
 - austenitic, NbC precip., rel. to heat treatment 3=18359
 - austenitic, precipitation, NbC precip. on stacking faults 3=18357
 - austenitic, stainless, stabilized with Ti; σ -phase formation and metastability 3=3337
 - austenitic, thermomechanical treatment 3=24383
 - case-hardened layer, substructure 3=1247
 - crack propagation, dynamic fracture 3=3242
 - diffraction of 8-45 Mc/s ultrasound 3=12918
 - discontinuities in long-term strength curves 3=23349
 - eddy current loss and domain width, var. with grain size and Si content 3=10727
 - 18 Cr/12 Ni/1 Nb austenitic, Ni and Cr precipitation 3=18358
 - elastic const., effect of temp. and alloying 3=13328
 - elastic consts. depend. on tensile stresses 3=3210
 - elastoplastic waves, prod. by explosion 3=18885
 - electrical engineering grade, magnetostriction, 20-750°C 3=3114
 - electron emission charac. in gases 3=418
 - electron emission in vacuo 3=5690
 - electron microscope exam., by replica, Cr-C 3=18426
 - embrittlement, rel. to neutron irradi. 3=11181
 - extra-soft, ageing effects 3=16111
 - fatigue behaviour, low-cycle 3=20753
 - fatigue damage, detn. 3=25643
 - fatigue fracture surface, electron microscope study 3=1244
 - fatigue limit of strain-aged material 3=8783
 - ferromanganese alloy, $\gamma = \epsilon$ transformation cycles 3=5128
 - 410 stainless, cold-work recovery rel. to neutron irradi. 3=11171
 - friction and wear of sapphire, erratum 3=11191
 - hardened steels, internal friction and work hardening 3=20696
 - hardening techniques 3=1235
 - heat treatment, mag., effect of field on hysteresis and mag. curve, Type E310 3=20584
 - heat treatment, 2-4% Si transformer steel, carbide formation and coercive force 3=18101
 - impact of radioactive projectiles 3=25646
 - for low temperatures 3=16847
 - Lüders front propag. in low-C steels 3=1225
 - magnetic hysteresis anisotropy, effect of stretching 3=20578
 - magnetization distribution, domain boundary layers 3=25530
 - magnetostriction, composition depend., 20-750°C 3=3114
 - mechanical strength criterion, for thermal fatigue 3=8779
 - mild, defect clusters, rel. to fission fragment irradi. 3=17803
 - mild, delay time, strain-rate and strain aging 3=1221
 - mild, delayed yield, effect of grain structure 3=1227
 - mild, yield point, rel. to Mn, Si, C, N additions 3=13358
 - molten, e.m. removal of nonmetallic occlusions 3=20912
 - neutron irradi., relaxation strains 3=20717
 - particle size and lattice distortions, effect of cold pressing, by X-ray reflections 3=18401
 - plastic deformation, initial processes 3=8764
 - plastic flow on explosive loading 3=1224
 - radioactive tracers, use in Czechoslovakia 3=6874
 - residual stresses, after deformation in yield plateau region 3=20712
 - SAE 4150, u.s. scatt., Rayleigh and stochastic 3=10590
 - shear stress under pressure 3=13354
 - shock wave damage, due to surface explosion 3=3852

Steel — contd

- shock waves, oblique collision; irregular conditions 3=1756
- "silicon steel", domain structure, rel. to u.s. vibration and alternating mag. flds. 3=11069
- "silicon steel", magnetic stability 3=11062
- silicon (3.25%) steel, mag. domain structure, effect of elec. field and tensile stress 3=15801
- soft magnetic, prod. for British elec. generating industry 3=17015
- spectrochemical analyser, multichannel, photoelectric, performance. 3=25849
- sputtering, using 1-5 keV Ar⁺ ions 3=9877
- stainless, defect clusters, rel. to fission fragment irradi. 3=17803
- stainless, disloc. rearrangement by electropolishing 3=10668
- stainless, dislocation rearrangement during electropolishing 3=17737
- stainless, electron micrographs 3=11334
- stainless, photoelec. yield, 3000-250 Å 3=21865
- stainless steels, Néel temperatures, determ. using Mössbauer effect 3=23153
- stainless, types 321, 420, total hemisph. emittance 3=289
- steel-2, radioactive, electrode potentials 3=16175
- stress, lattice, residual, on plastic deformation, X-ray diffr. meas. 3=18180
- stress shear, under pressure, annular specimens 3=6784
- stresses, internal, 0.01-1.25°C, Cr K α X-ray meas., reliability 3=13346
- Teflon coated, bearings for instrument alignment 3=9393
- thermal e.m.f. rel. to plastic deformation 3=13141
- transformer, domain-wall widths 3=13252
- U-10, quenched, tempered, lattice distortions 3=16106
- u.s. velocity meas. 3=21502
- wool, acoustic wave propag. 3=11862
- worked, autoradiography of defects 3=5143
- yield and flow stress, rel. to grain size 3=11149
- H₂ penetration in rolling surfaces with water-accel. fatigue 3=25644
- Mn-Mo steels, embrittlement rel. to neutron irradi. 3=11182
- MnS inclusions, dislocations 3=25282
- Ni-Cr-Mo alloy steel, martensite formation rel. to applied tensile stress 3=3323
- Ni-steel, u.s. wave velocity rel. to stress 3=6471
- Si steel sheet, mag. structure, demagnetization effects 3=13253

Stellar clusters

See Stars.

Stellar composition

See Stars, composition.

Stellar motion

See Stars.

Stellar structure

See Stars, structure.

Stereoscopy

- binocular eye movements and depth discrim. 3=5302
- depth perception from after-images 3=9306
- perceptual fluctuations with ambiguous figure 3=9308
- projected images, binocular combination 3=3691
- stability threshold for intermittent stimulation 3=1565
- stereoscopic acuity rel. to obs. distance 3=11635

Stopping power

See Particle range.

Storms

See Atmosphere, movements; Magnetic storms; Thunderstorms.

Strain gauges

- optical, silhouette, tensile, under high hydrostatic pressure 3=13343
- photoelastic, coatings 3=14092
- prefabricated, resistance 3=97
- pressure meas., external, in glass systems, borosilicate, 0-2 atm. 3=21290
- resistance and photoelastic, modern forms 3=7170
- resistance type, pressure depend. 3=23334
- semiconductor piezoresistive devices 3=22969
- PbS sensitivity, methods of obtaining 3=18176

Strain gauges — contd

- Pt-W alloy, for over 340°C 3=6771
- Pt-W-Cu, tests, high-temperatures 3=11747

Strange particles

- compound model with baryons 3=17173
- decay, noneptonic, $|\Delta I| = \frac{1}{2}$ selection rule 3=2197
- diffractional production, by p-nucleus interactions 3=15169
- interaction resonances rel. to Sakata model bound states 3=5928
- isobars, 0 isospin, exptl. evidence 3=4463
- pairs, prodn. by 6, 11, 18 GeV/c π^- interacts 3=24775
- parastatistics 3=12506
- photoproduction 3=22203
- π^- -p collisions, above 10 GeV 3=4360
- prodn. in π^- -p interacts., 11.4 GeV/c 3=19674
- production by 4.65 BeV/c π^- -mesons 3=12507
- production by π^- on propane, resonances 3=2322
- production cross-sections 3=19700
- production from π^- -p interacts., 16 GeV/c 3=15012
- production in proton-nucleon collisions, calc. 3=7927
- production in p-p collisions, 24.5 GeV/c 3=22206
- production, π^- -Xe interaction 3=24796
- proton-antiproton annihilation, statist. model 3=7858
- resonant states, phenomenological theories 3=14872
- spin-statistics connection? 3=22202
- strangeness replaced by new symmetry in strong interactions 3=5931-2
- Y* and Y*, exptl. evidence 3=4462
- Y*, 1385 MeV, K and π prodn. isobars 3=4463

Strength

See Electric strength; Mechanical strength.

Stress analysis

See also Bending; Photoelasticity; Strain gauges; Torsion.

- adsorption-extension phenomena 3=20937
- aeotropic solid, two-dim. thermal stresses 3=23808
- buckling of rect. orthotropic plates 3=85
- compression, thermodynamic limitation on modulus 3=21273
- cyclically consolidating media 3=16559
- deformed and stresses states considered as initial state 3=23817
- disks, with phys. characteristics varying along radius, elastic tension meas. 3=18763
- dynamic problems, conference 3=13342
- elastic rod, thin, semi-infinite, when free end is subjected to instantaneous temp. rise or transient temp. distrib. 3=14082
- fatigue-curve parameter, estimation method, with limited number of specimens 3=20733
- fracture theory of surfaces of maximum shear 3=3773
- hole in beam bent with shear, stress distrib. 3=23810
- inclusion problem 3=790
- inelastic material behaviour 3=14076
- interfacial instability under initial stress 3=14079
- internal buckling under initial strain 3=14077
- isotropic elastic materials, energy functions 3=11736
- magnetoelastic stresses in rotating cylinder in mag. field 3=23811
- metallic films, lattice strain 3=20932
- metals, quadratic elasticity theory and electron density 3=5053
- nonlinear thin plate inextensional bending theory 3=87
- nontransparent solid bodies, by γ -absorption, possibility 3=20703
- plane frames, elastic-plastic failure loads 3=21272
- plastic deformation, cyclic, consolidating medium 3=16559
- plastic materials, rate-sensitive, constitutive eqns. 3=11738
- from polarized light, elliptical 3=23813
- principle of minimum complementary energy 3=92
- shells, instability, local, bulging 3=5394
- simulation of random stress fatigue effects by minimum number of discrete stress levels 3=5403
- solid surface, by differential geometry 3=21271
- strain, plane, boundary value soln. 3=7160
- stress due to nucleus of thermoelastic strain 3=23809
- strip, infinite 3=5393
- surface instability under initial stress 3=14078

Stress analysis — contd

- thermal, elastoplastic, in solidifying body 3=18764
- thermal stresses, crack in semi-infinite solid 3=9382
- thin elastic shells, strain energy 3=16560
- viscoelastic flow in tube, axial stress at wall 3=11772
- viscoelastic materials, isotropic, stress tensor 3=7159
- Cu films 3=11145
- KCl, shearing temperature range of quenching 3=11172

Stress effects

- acousto-elastic effect, velo. meas., metallurgical appls. 3=23275
- alloys, magnetic structure and properties 3=8634
- on anisotropic defects in crystals 3=22695
- bar, cylindrical, plastic strain wave propag. 3=5484
- body-centred cubic crystal, moving edge dislocations 3=10654
- α -brass, stress-corrosion process 3=11190
- Bravais crystal, phonon frequ. shifts 3=2717
- crystals, review 3=25626
- crystals, vacancy formation, rel. to internal stresses 3=22741
- dislocation helix or prismatic loop 3=8434
- dislocation vel. depend. on stress 3=13341
- ferromagnet, elastic, rel. to Barkhausen noise 3=3104
- ferromagnetic films, rel. to orientation 3=20598
- glass, micropore growth 3=18365
- glass, silica, high-pressure densification, effects of shear 3=8919
- ice, effect on subsequent thermoluminesc. 3=13649
- magnetic hysteresis loops, asymm., creep 3=6705
- metal films, resistance-strain characteristics 3=22902
- metals, cold-worked, particle size and strain broadening separation, X-ray profiles 3=25754
- metals, cyclic, effect on internal stresses 3=13345
- metals, vibratory 3=13377
- nuclear spin diffusion, strain interruption 3=3186
- ordering alloys, strain ageing 3=8775
- oxide crystals, symm. splitting 3=25614
- paper, surface structure under rolling pressure 3=13553
- polymethylmethacrylate in diphenyl solution, shear rel. to viscosity 3=16619
- polymethyl methacrylate, stretching, 100°-200°C rel. to birefringence 3=17982
- semiconductors, kink nucleation theory 3=17730
- semiconductors, many-valley, elastocaloric effect 3=4832
- shear, on viscosity, lubricating oils 3=9422
- soil deformation by beam resting on it 3=5144
- solid solns., strain ageing, solute atom segreg. 3=5139-40
- steel, austenitic, stainless, Ti-stabilized; rel. to weld corrosion 3=3337
- steel, fatigue damage 3=25643
- steel, Ni—Cr—Mo alloy, rel. to martensite transformation 3=3323
- steels, elastic consts. depend. on tensile stresses 3=3210
- Al, absorption, acoustic waves, u.s., time var., 15-200 Mc/s 3=22648
- Al, cyclic, effect on internal stresses 3=13345
- Al, fatigue investigation 3=18213
- Al, tensile, dislocation arrangements 3=20754
- Al—Mg alloy, fatigue, superimposed at 1% of static, rel. to creep. 3=13365
- Au, fatigue investigation 3=18213
- Au, pure, void formation 3=13364
- BaTiO₃, domain orientation, rel. to mechanical load 3=22995
- BaTiO₃, structure rel. to hydrostatic pressure up to 600 kg cm⁻² 3=3302
- CaCO₃, twinning kinetics 3=3260
- CaF₂(Eu²⁺), uniaxial stress spectra 3=10943
- CdSe, exciton lines 3=6652
- Co, deformation twins, by tensile loading, -196°C 3=8800
- Cu, dislocation loops, prismatic 3=10671
- Cu, fatigue investigation 3=18213
- Cu, work hardening under cyclic straining 3=20737
- Cu—Ni films, submicroporosity 3=23510
- Cu₃Au, ordered, strain hardening 3=18001
- Cu, Cu^{Al}, dislocations from cyclic strains 3=12984
- CuO, absorption spectrum, blue region 3=4971
- Fe wires, small torsion, mag. anisotropy 3=20577

Stress effects — contd

- Fe—3%Si, mag. domain structure, effect of compression 3=13263
- Ge donor spin-resonance lines 3=10792
- Ge, doped with P, e.s.r. line splitting 3=18131
- Ge, doped with Sb and Ga, piezothermal cond., liq. He temp. 3=10766
- Ge, elastocaloric effect, calc. 3=4832
- Ge, n-type, degenerate, piezoresistance, valley splitting 3=10787
- Ge p-n junctions, excess current 3=25378
- Ge, Sb- and As-doped, conductivity, 1° to 300° K 3=22931
- Ge, Sb-doped, interband tunnelling 3=13095
- LiF: hexavalent U, spectral line, splitting 3=8619
- Mg grain boundary cavities, nucleation 3=17773
- MgO, dislocations, rel. to neutron-irrad. 3=18185
- MgO, ²E state of V²⁺, splitting 3=23108
- MgO, rolling contact stresses, plastic deformation 3=23321
- Mn ferrites, effect on hysteresis loop 3=23189
- NaCl, absorption of u.s. 3=15491
- NaCl—BaCl system, disloc. loops 3=17720
- NaCl, CdCl₂-doped, strain ageing 3=18002
- Nb₃Sn, thin surf. layers, rel. to superconductivity 3=1903
- Ni alloys, anhysteretic curves after demag. 3=11061
- Ni-steel, u.s. wave velocity 3=6471
- Ni wires, small torsion, mag. anisotropy 3=20577
- Ni—Cr films, strain sensitivity 3=23514
- Ni—Cr, on type of rupture 3=3239
- Ni—Fe alloys, ordering, strain ageing 3=8775
- PbS, rel. to electrical conductivity 3=10833
- PbSe, rel. to electrical conductivity 3=10833
- PbTe, rel. to electrical conductivity 3=10833
- 3% Si—Fe, initial mag. curve, tension effects 3=25527
- Si-iron, magnetic texture 3=8663
- Si plate, X-ray transmitted diffraction intensity 3=23525
- Si, uniaxial strain, on J = $\frac{1}{2}$ valence-band edge 3=4797
- Si, valence band structure and cyclotron res. 3=8414-15
- β -Sn, resistive stress for twin thickening 3=25659
- Zn, work hardening and fracture 3=18200

Stress measurement

See Dynamometers; Strain gauges.

Stress/strain relations

See also Elastic constants.

- alkali halide crystals, rel. to annealing, plastic deformation and γ -irradiation 3=22649
- α -brass, shear, and work hardening, 4.2-500° K 3=20725
- dislocation hysteresis, theory 3=23306
- elasto-plasticity, non-linear boundary value problem 3=7154
- epoxy resin in compression up to 6 ton in⁻¹ 3=25440
- films, rel. to substrate properties 3=15980
- graphite, during thermal cycling 3=23308
- inelastic material behaviour 3=14076
- inside earth, finite deformations 3=13644
- metal, f.c.c., plastic deformation 3=11158
- metal foils from rolled material, testing procedure 3=5073
- metal tubes, apparatus with programme facilities 3=18188
- metals, after fast neutron doses 3=20717
- metals, b.c.c., friction-stress and yield point 3=8765
- metals, yield plateau, deformation processes 3=5062
- particle assemblies, stress — dilatancy relation 3=1363
- plane frame, rigid-plastic deformation 3=21272
- polymers, liquid 3=21351
- powders, liquid filled 3=11737
- pseudoplastic flow region 3=18198
- rubber hydrochloride, cryst., stress relax. 3=1133
- shells, nonlinear theory under Kirchhoff hypothesis 3=21270
- solid, isotropic incompressible elastic 3=9378
- solid surface, analysis by differential geometry 3=21271
- solids, finite strain, theory 3=20705
- solids, models, wide class, determination 3=18173
- steel, low-cycle fatigue behaviour 3=20753
- steel, mild, rel. to delay time and yield stress 3=1221
- steels, low-C, Lüders front propag. meas. 3=1225
- strain rate, neutron irrad. effects 3=13018
- stress depend. of dislocation vel. 3=13341
- strip, infinite 3=5393
- tensor, invariant parameters 3=13324

Stress/strain relations — contd

- tin bronze alloys, repeated yielding 3=23327
- Ag, films, 35-50 μ , 100-300°C 3=6783
- Ag-Zn alloy, in tension and shear 3=15986
- Al alloys, low-cycle fatigue behaviour 3=20753
- Al, cyclic work hardening, Bauschinger effect 3=20738
- Al, fatigue, tension-compression 3=11139
- Al, hysteresis loop, torsional fatigue 3=25609
- Al, polycrystalline, 90-300°K 3=3230
- Al, rel. to Bauschinger effect and dislocation arrangements 3=17746
- Al, strain-cycled, hysteresis 3=20752
- Al, 24°C 3=13340
- Al-(4%)Cu, rel. to dislocation-decomposition produce interaction 3=23305
- Cd, hardening by strain cycling 3=13372
- Cd, polycryst., strength and ductility 3=15994
- Cr, Young's modulus and damping, 90° to 480°K 3=25604
- Cu, films, 35-50 μ , 100-300°C 3=6783
- Cu foils, from rolled Cu 3=5073
- Cu, neutron irradi., strain rate depend. of flow stress 3=20719
- Cu, polycrystalline, 90-300°K 3=3230
- Cu, rel. to dislocations 3=22788
- Cu, rel. to elongated dislocation loops 3=2805
- Cu, rel. to work hardening 3=23344
- Cu, serrations and bump on curve, rel. to irradi. recovery 3=22751
- Cu, shear, and work hardening, 4.2-500°K 3=20725
- Cu, yield stress, vacancy cluster effects 3=25618
- Cu-Si-(Mn) alloys, yield stress rel. to deformation and annealing 3=22701
- Cu-Sn solids solns., strain ageing 3=23346
- Fe, effect of neutron irradi. and temp. 3=11168
- Fe, low C content, time-depend. props. 3=15992
- Fe, rel. to fast neutron irradi., 4 \times 300°K 3=8759
- α -Fe, yield plateau on addition of B 3=13357
- Ge, compression of monocrystals, rel. to dislocations 3=6516
- Mo, yield stress parameters det. 3=6782
- NaCl 3=17762
- Ni, yield point rel. to strain ageing 3=13350
- Ni-Cr base alloy, heat treatment effect 3=18351
- SiO films, stress anisotropy rel. to prep. 3=11144
- Sn, polycrystalline, diagram, position of jumps 3=3218
- TiC-WC-Co alloys, rel. to structure 3=18184
- W, heat treatment temp. effects 3=23307
- W, Young's modulus rel. to recovery after work hardening 3=11174
- Zn, nonelastic strain recovery 3=8776
- Zn, rel. to irradiations 3=18174

Stresses, internal

- anisotropic bodies, due to dislocations 3=5063
- brass, α -, microscopic strain distrib. 3=6799
- carbides, sintered, x-ray meas. 3=25619
- crystalline overgrowths, residual strains 3=3278
- crystals, rel. to n.q.r., tensors 3=3206
- about cut, in elastic body 3=18216
- diamond, due to crystal distortion during growth 3=25285
- digenite (Cu₂-S), due to crystal distortion during growth 3=25285
- dislocation stress fields due to elastic anisotropy 3=10661
- dislocations, moving, continuous distrib. 3=15492
- effect on elastic stiffness 3=7157
- electrolytic coating, meas. of residual stresses 3=15983
- films, solid, vacuum deposition control 3=13566
- films, vac. deposited, meas. probe 3=16142
- glass, quenched in liquids 3=15984
- graphite, during thermal cycling 3=23308
- metal foils, electron diff. contrast microscopy 3=20702
- metals and plastics, creep and rupture, parameters 3=8761
- metals, effect of cyclic strain 3=13345
- noble metals, stack fault tetrahedra, effects 3=12994
- nonuniform stress fields, rel. to linear dislocations 3=795
- quartz crystals, vibrating internal displacements, by X-ray diff. 3=15982
- rocks, in wave attenuation, analysis 3=14234
- sphalerite, due to crystal distortion during growth 3=25285
- steel, hair-line crack formation 3=3241

Stresses, internal — contd

- steel lattice, residual, on plastic deformation, X-ray diff. meas. 3=18180
 - steel, mild, relation to mag. permeability and hysteresis 3=23301
 - steel, residual stresses, after deformation in yield plateau region 3=20712
 - steels, 0.01-1.25%C, Cr K α X-ray meas., reliability 3=13346
 - thermal, in metallic crystals, cubic symmetry 3=20112
 - due to thermoelastic strain in elastic solid 3=23809
 - III-V cpds., rel. to bonding on A surfaces 3=3219
 - transverse crack, due to 3=21275
 - Vicalloy II, rel. to mag. hardness 3=1139
 - X-ray meas., interference line analysis 3=20704
 - Al, bending stresses at grain boundaries 3=18177
 - Al, effect of cyclic strain 3=13345
 - Co, polycryst., stored energy and dislocations 3=11159
 - Cu crystals, flow stress after neutron irradi. 3=20719
 - Cu-Co alloy, coherency strains around precipitates 3=1222
 - InSb, elastic strain energy 3=3219
 - Fe, lattice, residual, on plastic deformation, X-ray diff. meas. 3=18180
 - Fe-Si single crystals, crack propag. 3=13379
 - Ge, vacancies, theory 3=22754
 - KCl, due to X-rays, rel. to intensity 3=6545
 - LiF films, meas. during deposition 3=16142
 - Mg, relaxation, dislocation processes 3=23310
 - Ni and ferromagnetic remanence/saturation mag. ratio, wire, -180 to +100°C 3=23160
 - Ni, films, evaporated, single-crystal, effect on mag. props. 3=13344
 - Ni-Co alloys, rel. to ferromag. domain patterns 3=18079
 - Ni-Fe films, rel. to magnetization direction 3=20595
 - Pb, deformed, analysis by X-ray diff. 3=20704
 - Sb films, evaporated 3=20701
 - Si, discrete stresses around dislocations 3=6518
 - Si, microstrains at B impurities, in dislocation-free crystals 3=15486
 - SiO evap. films, effect of exposure to air 3=1365
 - SiO, sublimated films, residual stresses 3=11146
 - SiO₂, vitreous, due to neutron irradi. 3=4899
 - UO₂, due to crystal distortion during growth 3=25285
- Stroboscopes**
- light source, stroboscopic 3=18976
 - tachometers, for strobe photography 3=3905
 - velocity meas., bullet, teaching demonstration 3=21286
- Strontium**
- atom, h.f.s., splitting of 5s5p³P₁ state 3=24842
 - atomic beams, surface ionization, from W 3=24226
 - damping capacity, shear modulus of elasticity 3=1216
 - deuteron scatt., 11.8 MeV, elastic and inelastic 3=17490
 - electrical resist., effect of temp. and press. 3=25323
 - in stars, high abundance 3=18641
- Strontium compounds**
- acetate, in soln., dissoci. rate, from u.s. absorpt. errata 3=5439
 - ferrites, Ba and Sr mixed, magnetic energy, magnetization and coercive forces 3=13279
 - SF₆⁻ formation by inelastically scatt. electrons 3=12068
 - Sr cyanoplatinate, as γ -scintillator 3=6668
 - Sr ferrite, modified, new permanent magnet material 3=15881
 - Sr ferrite, powder, single-domain magnetic props. 3=15880
 - Sr formate, simple and dihydrate, elastic and thermoelastic props. 3=23281
 - Sr molybdate crystals, refractive index 3=13150
 - Sr-B phosphors, luminescence kinetics 3=10993
 - SrB₆, semiconducting props. and electron requirements 3=8330
 - Sr-Bi titanates, phase transformations, rel. to ferroelec. props 3=25653
 - SrCO₃, aragonite structure, out-of-plane bending of the CO₃ ion 3=25189
 - (Sr_{0.78}Ca_{0.22})(Ti_{0.78}Sn_{0.22})O₃, anomalous polarization and discharge currents 3=13120
 - SrCl₂:Sm²⁺, absorpt. and fluoresc. spectra 3=13204
 - SrD, near u.v. absorption bands 3=25106
 - SrF₂, coloration spectra 3=2837

Strontium compounds — contd

- SrF₆, decomposition, electron irradi. in micro-scope 3=21004
 SrF₂, e.s.r. of U⁴⁺, charge compensation 3=3180
 SrF₂, Er³⁺ and Yb³⁺ absorption and luminescence spectra 3=3000
 SrF₂, Eu²⁺, Sm³⁺ impurities, electron phototransfer 3=951
 SrF₂, growth of highly-perfect single crystals for masers, 3=23397
 SrF₂: Nd, absorption spectra, luminescence, 77°K, optical maser 3=20482
 SrF₂: Sm²⁺, luminescence kinetics 3=4986
 SrF₂:Sm²⁺, absorption and luminescence spectra, Zeeman effect 3=18026
 SrF₂:Sm²⁺, fluoresc. selection rules 3=13204
 SrF₂, surface energy of {110} face 3=22632
 SrF₂, U-activated, luminescence; "relaxation spectra" 3=3035
 SrF₂: Y, X-irrad., colouration spectrum 3=8593
 Sr₂FeNbO₆, phase transitions
 Sr₂FeTaO₆, phase transform. at 250°C, X-ray study 3=18226
 Sr(GeO₃) crystal symmetry and structure as model for Ca(SiO₃) 3=18316
 SrGeO₃, electron density projection plot 3=23456
 SrH, near u.v. absorption bands 3=25106
 Sr₆Li₁₃ and Sr₃Li₂, crystal structure 3=11266
 Sr₂Mg₁₇, crystal structure 3=20837
 Sr₂Mg₁₇, crystal structure, atomic 3=20838
 SrNb₃ u.v. spectral and photoelec. props. 3=25450
 Sr(NO₃)₂, elastic and thermoelastic props. 3=18161
 SrNb₂O₆-0.5YbFeO₃, ferroelectricity 3=23003
 Sr(NiW)₂O₈, phase transitions 3=8864
 SrO cathodes, on O-Ni base, emissivity, var. with thickness 3=20440
 SrO on nickel core, thermoelec. power 3=25426
 SrO, thermionic emission on doping with rare earths 3=422
 SrO, (BaSr)O, cathodes, thermoelectric power, and conductivities 3=17969
 SrO-CeO₂, luminescence 3=6672
 Sr(OH)₂.8H₂O, OH bond orientation 3=4968
 SrO.2BaO₃ and SrO.4BaO₃, lead-activated, luminescence and dark elec. cond. 3=2925
 Sr₃(PO₄)₃(Cl,F):Sb, Mn, luminesc. 3=10991
 SrS, dielec. props at 7.25 Mc/s 3=17932
 SrS, dissociation energy D₀ = 80 kcal/mole 3=25806
 SrS, Mn activator incorporation 3=12965
 SrS, Mn²⁺ e.s.r. 3=5042
 SrS, spin-lattice relax. theory of Mn²⁺ 3=25562
 SrTiO₃, dielec. and electrocaloric props. 3=2957
 SrTiO₃, dielec. and electrostrict. 3=8562
 SrTiO₃, dielec. const. at low temps. 3=4946
 SrTiO₃, dielectric loss, u.h.f., defect theory for var. with freq. and temp. 3=17933
 SrTiO₃, elastic constants, from sound vel. meas. 3=13332
 SrTiO₃, elastic consts. under phase transition 3=5055
 SrTiO₃, electret, lattice distortions after electrification 3=10652
 SrTiO₃, force consts. from i.r. spectrum 3=25180
 SrTiO₃, paramag. particles, e.s.r. 3=15935
 SrTiO₃, phase transition, n.m.r. study 3=8791
 SrTiO₃, spectrum, i.r., 670-15 cm⁻¹, absorpt. 3=23064
 SrTiO₃, thin sections, microscopic examination, low-temp. 3=17940
 SrTiO₃-Bi₂O₃.3TiO₂, dielec. props. 3=15620
 Sr₂ZrAs₂O₈, luminesc. and crystal structure 3=10982
 Sr₂ZrP₂O₈, luminesc. and crystal structure 3=10982
 SrZrS₂, synthesis and crystal structure 3=8850

Sublimation

- See also Heat of sublimation; Vaporization.
 ammonium halides, rates 3=1874
 isotope effects on equilibria 3=21611
 naphthalene crystals, etch-pit formation 3=3934
 transfer between two surfaces, kinetic theory 3=14427
 vacuum, heat exchange, rel. to radiation 3=16841
 Ba cathodes, meas. technique and results 3=9830
 BaO, and W, work function, changes 3=19294
 BaO cathodes, meas. techniques and results 3=9830
 CaF₂, pressures meas. 1242°-1669°K 3=21638
 CdTe, solid-vapour equil., ΔH° and ΔS° 3=1877

Sublimation — contd

- S, sublimated, e.s.r. 3=1191
 SiC, in Ar gas, single-crystal growth 3=5085
 W, shadowing of electron-microscope specimens 3=11329
 ZnO films, luminescent, prep. 3=16144
 ZnS films, luminescent, prep. 3=16144
- Sulphur**
 fibrous, structure, atomic 3=18371
 graphitization effects on cast iron 3=11300
 i.r. reflectance standard 3=11882
 ions, forbidden transition probabs. calc. 3=25055
 liquid, polymer chains, length, by e.s.r. and mag. susceptibility 3=14155
 molecule, emission band system 3=12833
 molecules, S₈, trapped at 20°K, vibration spectra 3=2624
 paramagnetic resonance of sublimated state 3=1191
 photoelectret polarization in darkness, initial elec. field effects 3=25411
 photoelectrets, effects of γ,β-rays 3=15622
 purple, annealing, e.s.r. study 3=20655
 rhombic, i.r. absorpt. 3=3021
 rhombic, i.r. transmittance 3=8603
 as semiconductor, intrinsic and extrinsic, polycrystalline 3=10839
 specific heat of liquid containing P, Se or Te 3=5430
 spectrochemical analysis, impurity effects, arcs. 3=25847
 spectrum, S₂, ground state X^{3Σ}_g⁻, triplet splitting 3=10525
 Stark effect in ionic gaseous H₂S and crystalline CaSO₄, X-ray K absorpt. spectrum and excitons 3=23097
 vapour, partial pressure of S₂ 3=13587
 vapour, reaction with Ni, diffusion process 3=1387
 X-ray spectra, K absorpt. in covalent gaseous SO₂, SOCl₂, SO₂Cl₂, ionic gaseous H₂O and crystalline CaSO₄, K spectrum 3=23097
 X-ray spectrum, emission, in PbS, L₂, 3=23096
 S vapour, equilibrium composition 3=25805
 S⁻, photodetachment spectrum 3=4003
 S₂, B^{2Σ}_g⁻, = X^{3Σ}_g⁻, perturbations 3=12831
 S-P₄S₁₀ amorphous solid solutions, effect of P on S chain stabilization 3=20916
- Sulphur compounds**
 halides, mol. structure 3=4759
 methyl isothiocyanate, molal thermodynamic props., ideal gas state, 273-1000°K 3=14210
 molecular refractivities 3=15332
 radiation-induced free radicals, e.s.r. in polycryst. state 3=3413
 sulphate, anhydrous, Raman spectra, comparison, and crystal forces 3=13186
 sulphate film-gas phase, high-temp. exchange, internal source effects 3=6896
 sulphates, photoconductivity meas. 3=8570
 sulphide phosphors, photocond. relax. theory 3=4953
 sulphides, with S₂ vapour in equilibrium, composition of vapour 3=25805
 thiolacetic acid, molal thermodynamic props., ideal gas state, 273-1000°K 3=14210
 thiourea, molal isothiocyanate, model thermodynamic props., ideal gas state, 273-1000°K 3=14210
 D₂SO₄, molecules, normal vibr. freqs. and thermodyn. props. 3=12842
 H₂S₂, molal thermodynamic props., ideal gas state, 273-1000°K 3=14210
 H₂SO₄, molecules, normal vibr. freqs. and thermodyn. props. 3=12842
 S cpds., outer shell, data from Kα transitions 3=19997
 S²⁻, reactions with PO₃³⁻, B₂O₃, TiO₂, MoO₃, WO₃, in molten NaF and NaCl, by cryometry 3=8967
 SCCl₄, force consts., in plane vibrations, compared with OCCl₄ 3=19998
 SCl₂, molal thermodynamic props., ideal gas state, 273-1000°C 3=14210
 S₂Cl₂, molal thermodynamic props., ideal gas state, 273-1000°K 3=14210
 SF₄, bond length differences, theory 3=10497
 SF₄, mol. structure, by electron diff. 3=25113
 SF₄, n.m.r. 3=17613
 SF₄, thermodynamic properties, 100° to 1500°K 3=21445

Sulphur compounds — contd

- SF₄, Urey-Bradley force field 3=19989
- SF₆, mol. structure, by electron diffraction 3=25113
- SF₆, Raman intensities for $\nu_1(a_1)$ modes 3=22559
- SF₆, spheres and SF₆-air mixtures, breakdown voltage 3=4095
- SF₆, Townsend discharge, ion identification and mobility, by time-of-flight mass spectrometry 3=16905
- SF₆, vibr. energy transfer with methyl ether, C₂F₄ and ethylene 3=6434
- SF₆Br, microwave spectrum and structure 3=22572
- S₂N₄, "electron-on-sphere", molecular-orbital model 3=727
- SO radical, absorpt. spectrum and dissociation 3=2625
- SO₂, as possible molecular beam frequency standard 3=12882
- SO₂, mol., rotation spectrum, 1st vib. state 3=12840
- SO₂, mol. structure det. from moments of inertia 3=2597
- SO₂, molecules, Stark effect calc. 3=8231
- SO₂, rotation spectrum 1300-25 500 Mc/s 3=4763
- SO₂, solns., u.s. absorpt., 2-15Mc/s, errata 3=5439
- SO₂, spectral line breadth and molecular interaction 3=12841
- SO₂, spectral linewidth and molecular interaction 3=17621
- SO₂, spectrum line broadening by N₂ 3=8279
- SO₂, X-ray spectrum, K absorpt. 3=23097
- SO₂ ions, prodn. by charge exchange with primary negative ions 3=7444
- SO₂, aq. soln., D substitution, effect on glass transform. temp. 3=23492
- SO₂, vapour pressure 3=9663
- SOCl₂, X-ray spectrum, K absorpt. 3=23097
- SO₂Cl₂, X-ray spectrum, K absorpt. 3=23097
- S₂O₃, heat of formation det. 3=1385
- S₂³²O₃, spectrum, 25-27.5 Gc/s 3=15351
- S³⁴O₂, rot. spectrum in first vibr. excited state 3=15351
- SOCl₂, AlCl₃; SOCl₂, 2AlCl₃ complexes, Raman spectra 3=14170
- SOF₄, thermodynamic properties, 100° to 1500°K 3=21445

Sun

See also Sunspots.

- acoustic noise generation in turbulent atmosphere 3=11540
- active regions, longitudinal distrib., and earth magnetic storms 3=23689
- activity, and earth pulsations, vertical 3=16190
- activity, April-June 1961
- activity, four-century cycle 3=9202
- atmosphere, composition, abundance of Be 3=13881
- atmosphere, departures from local thermodynamic equilib. 3=7029
- atmosphere, electron accel. rel. to type IV bursts 3=11548
- atmosphere, mechanical energy 3=3572
- and atmosphere, upper, density, effects on 3=18523
- atmospheric model, rel. to u.v. spectrum 3=23685
- capture of absorbing particles by radiation field 3=9188
- chromosphere, convection, rel. to mag. field structure 3=9209
- chromosphere, hydrodynamic oscillations 3=13887
- chromosphere, MgI excitation 3=11543
- chromosphere near sunspots, motions 3=3575
- chromosphere, new model and excitation of HeI 3=13889
- chromosphere, review 3=1523
- cycle, and ionosphere, I.G.Y., crit. freqs. and virtual heights, Morocco 3=16286
- disturbances, and ionosphere and geomag., Nov. 1960 3=18527
- early history, rel. to formation of planets 3=13880
- eclipses, isomorphous regions 3=1517
- effect on earth, magnetic field, annual vars. 3=16300
- equator-polar temperature difference 3=3571
- faculae in photosphere, model for 3=11535
- faculae, spectral contrast with photosphere 3=9194
- focculi and atmospheric pressure increases 3=23589
- granulation, brightness fluctuation 3=1520
- granulation data, interpret. 3=11533
- granules, and transitory movements of unstable systems 3=18630
- gravitational contraction, early phases, Hayashi effect 3=21104

Sun — contd

- hydrogen convection zone, higher modes 3=21105
 - and interplanetary mag. field, Pioneer V meas. 3=16329
 - ionization equilibrium eqn. of state 3=16401
 - ionizing radiation, E-region, and 20cm radiation 3=16271
 - observation, visual photometer 3=9140
 - observations 1959-60, conference 3=9139
 - observatory, Long Island, equipment 3=7016
 - periodic activity, analysis and empirical eqns. 3=5258
 - photophase, temp. fluctuations 3=16370
 - photosphere, departures from LTE, rel. to Fe lines 3=5253
 - photosphere, large-scale motions 3=9196
 - photosphere, large-scale motions 3=11536
 - photosphere, local brightness, vel. variations 3=1520
 - photosphere, outer, temp. distrib., from thermodynamics 3=16374
 - photospheric intensity variations 3=3568
 - plasma radiation, and atmosphere, upper, hydromagnetic waves, freq. cut-off 3=16304
 - "red noise" power spectrum 3=16539
 - solar wind, evidence from comet tails 3=18625
 - solar wind flow, direction; effect on magnetic activity 3=7003
 - temperature meas. at 2 mm wavelength 3=5271
 - wind, boundary with geomagnetic field, location convection 3=16307
 - Bi abundance from BiII lines 3=9195
 - C abundance, automatic computation 3=13884
 - H convection zone, unstable modes 3=13882
 - P₁ type peaks, type I bursts, prodn. mechanism 3=11544
- corona**
- brightness distrib. meas. at eclipse 3=18637
 - condensation model, core and surroundings 3=16385
 - condensation, obs. in eclipse, model 3=9219
 - coronagraph, scattered light reduction 3=9142
 - coronameter, photoelec., automatic 3=9216
 - diamagnetic effect of charged particles 3=16392
 - electron density, intensity, polarization 3=9218
 - electron density, solution of van de Hulst's integral equations 3=18635
 - electron density, radial distrib. 3=18651
 - excitation of coronal ions, effect of self-emission 3=13891
 - green line λ 5303, intensity gradients 3=13892
 - heating, by gravity waves 3=13888
 - heating mechanisms from spectroscopic obs. 3=11542
 - hydrodynamic models, and solar wind 3=16390-91
 - inner, spectrum meas. at eclipse 3=18636
 - ionization, two-step collision process 3=9211
 - lower, Fe abundance 3=21112
 - magnetic field var. and electron concn. 3=9212
 - mechanical energy 3=3572
 - models, hydrodynamic 3=9217
 - monochromatic emission, characteristics 3=9215
 - monochromatic studies 3=16387
 - occultation of Crab Nebula, June 1962 3=13936
 - photographs from balloons during eclipse 3=1518
 - plasma oscillations 3=23704
 - polarigraphic obs. during 12 Oct. 1958 eclipse 3=1519
 - and prominences, rising 3=16375
 - solar atmosphere, macroscopic inhomogeneities 3=3565-6
 - spatial structure 3=3578
 - spectra, three emission ratios and different temps., corona 3=18638
 - spectrum Fe XIII lines, relative intensities 3=23687
 - spectrum, ultraviolet, in lower corona 3=13890
 - spicules, kinematics 3=9214
 - temperature grad. rel. to solar wind 3=9210
 - transition layer with chromosphere, models 3=16386
 - u.v. and soft X-rays 3=16389
 - X-ray emission by condensations 3=9206
 - H, pressure and positive Joshi effect 3=19207
- flares**
- association with geomag. disturbances, 1949-61 3=21110
 - chromospheric, correl. with radio emission 3=1522
 - class 3+, effects on ionosphere 3=16264
 - cosmic rays and 7-stage, (18 July 1961) 3=12527
 - dark filament, activation 3=16379
 - e.m. continuum radiation 3=11549
 - effect on ionosphere F2-region 3=13757
 - effects on ionosphere 3=13704

Sun — contd

flares — contd

- electron density, from cosmic ray proton interactions 3=11546
- energy release mechanisms 3=16381
- explosive phase, rel. to ionospheric sudden disturbances 3=13703
- filaments, correl. with geomag. activity 3=11467
- ionospheric responses 3=23612
- limb, physical structure eval. 3=11545
- limb, selective excitation conditions 3=9207
- magnetic fields, transversal, correl. 3=9208
- magnetic storm time delays, effect of pre-storm conditions 3=7002
- new class, correl. with ionospheric absorpt., polar 3=16376
- north-south asymmetry, long-term 3=18631
- photometry of region prod. 10.7 cm bursts 3=23706
- and prominences 3=23688
- radio-burst event selection, rel. to polar-cap absorption 3=13920
- radio burst generation by class 3 flare 3=25978
- radio bursts and flare importance 200-9400Mc/s 3=16377
- and radio storms, 169 Mc/s 3=18650
- rel. to type V bursts 3=11590
- Sept. 2, 1960, spectrum of flash-phase 3=11541
- solar wind, rel. to corona temp. grad. 3=9210
- source, complex fields in and below photosphere 3=3582
- from sunspot group, (July 1961) 3=11539
- superflares and H α striation pattern 3=16378
- theory, rel. to plasma stability theory 3=7515
- type IV radiation, covering sunspots 3=21126
- and X-radiation, by rockets and satellite 3=11481
- H α , inclination 3=13893
- 1959, 1961, rel. to protons and α -particles 3=17362
- 1961, obs. in Stockholm and Anacapri 3=9221
- 20 July 1961, Western Limb, rel. to radio and corpuscular emission 3=10191
- 27 Sept. 1960, rel. to type IV cosmic-ray burst 3=10189
- 28 Sept. 1961, proton and energetic storm particles meas. 3=7953
- 28 Sept. 1961, X-ray burst 3=9220

magnetism

- chromospheric motions near sunspots, correl. 3=3575
- corona, variations meas. 3=9212
- cosmic rays, variations, short term, and magnetic clouds 3=12534
- flare of 16 July, 1959, magnetism in active region 3=16380
- interaction with solar wind 3=16368
- magnetohydrodynamic stability of sub-photospheric tube of force 3=18629
- network, rel. to chromospheric convection 3=9209
- transversal fields, rel. to flares 3=9208

prominences

- activation meas., rel. to moving disturbances 3=9222
- active selective excitation conditions 3=9207
- artificial, caused by aircraft crossing sun 3=11547
- electron conc. (Oct. 2, 1959, lat + 37°) 3=16382
- and flares 3=23688
- formation, rel. to effect of charged particles on corona 3=16392
- long-lived filaments, lack of correl. with mag. storms 3=16305
- loop, and sprays, (July 1, 1960), spectrum 3=11550
- 1960 observations 3=9223
- prominence activity, 1944-54 3=3583
- quiescent prominences, model and temperatures 3=16384
- quiescent, stability from H α -line data 3=16383
- rising, and corona 3=16375
- from sunspot group, (July 1961) 3=11539
- and X-radiation, by rockets and satellite 3=11481

radiation

- See also Sunlight.
- absolute intensity at centre of disk in near i.r. 3=21106
- battery, Pb-acid storage, apparent control, in 11 yr cycle 3=1927
- bursts, associated with chromospheric flares 3=1522
- chromosphere, thermal equilib. of electrons 3=3581
- corpuscular, acceleration by class 3 flare 3=25978

Sun — contd

radiation — contd

- corpuscular, geomag. hollow at earth 3=9120
 - corpuscular, interaction with earth's magnetic field, dipole 3=24288
 - corpuscular, magnetohydrodyn. instability 3=9213
 - corpuscular, polar atmosph. heating 3=13796
 - corpuscular, shock wave excitation in comets 3=9181
 - corpuscular wind, interaction with solar mag. field 3=16368
 - Cosmic rays, intensity, energy spectra 3=24751
 - M corpuscles and atmospheric pressure increases 3=23589
 - Mariner II, solar plasma expt. 3=7028
 - particles, air fluorescence detect. possibility, O⁺, N₂⁺ 3=25931
 - and satellites, artificial non-spherical, pressure effects, orbital 3=23715
 - short-wave, filter apparatus 3=9151
 - short-wave, flux meas. with photon-counters 3=9189
 - short-wave, suitable photocathodes 3=9150
 - solar neutrino flux 3=13879
 - solar wind-geomag. fld. interaction 3=25958
 - spectrometer for far u.v. 3=23682
 - type IV outburst, rel. to cosmic-ray diurnal variation 3=24827
 - u.v. and radio, and atmospheric structure 3=23686
 - u.v., atmospheric effects, satellite obs., non-Russian 3=18492
 - u.v. continuum study 3=3885
 - wind, solar, effect on atmospheric density above 200 km 3=9068
 - wind velo., non-uniformity, and cosmic-ray variations 3=21111
 - X-ray, and sunspot activity, solar flares and prominences 3=11481
 - X-ray and u.v., ionospheric effects 3=13739-40
 - X-ray burst, rel. to flare, 28 Sept. 1961 3=9220
 - X-ray photograph interpret. 3=9206
 - X-ray, photon energy distrib. meas. 3=9190
 - X-rays rel. to ionosphere D-region sudden disturbances 3=6981
 - X-ray, space satellite meas. 3=23681
 - He emission, far u.v., space vehicle meas. 3=23683
- radiation, radiofrequency**
- active-region emission, λ = 3-21 cm 3=16424
 - burst generation by class 3 flare 3=25978
 - bursts, 5-210 Mc/s, cut-offs due to ionosphere 3=1538
 - bursts, 10.7 cm, from flare region 3=23706
 - cm and lower dm range, emission bursts 3=25977
 - cm wave bursts rel. to metre wave bursts 3=1540
 - conference, Kyoto, 1961 3=15054
 - decimetre radio bursts 3=11589
 - disturbances, catalogue, July 1961 3=18529
 - during eclipse, 15 Feb. 1961, 1.5-4m 3=1539
 - fast-drift bursts, excitation 3=23704
 - flare radio-burst event selection, rel. to polar-cap absorption 3=13920
 - flares, e.m. continuum 3=11549
 - and ionizing radiation, E-region 3=16271
 - local sources, 4 and 8 mm identific. 3=13921
 - meter wave bursts, directivities 3=16425
 - radioastronomy conference 3=13916
 - radioheliograph, with 100, 42 ft paraboloids, Australia 3=5270
 - slowly varying component, 470-29000 Mc/s 3=9262
 - sources of slowly varying component, model 3=3618
 - storms, 169 Mc/s and chromosphere, flares 3=18650
 - 20 cm flux, correl. with Venus obs. at 440 Mc/s 3=5276
 - 20 July 1961, rel. to flare 3=10191
 - 2 mm, apparent temperature meas. 3=5271
 - type I bursts, P₁ type peaks, prodn. mechanism 3=11544
 - type II and IV bursts, catalogue 3=13919
 - type II bursts, positions, movements 3=18651
 - type IV burst, rel. to solar flare of 27 Sept. 1960 3=10189
 - type IV bursts, rel. to electron accel. in atmosph. 3=11548
 - type IV, linear polarization 3=23707
 - type IV outbursts, rel. to low-energy cosmic rays 3=23705
 - type V bursts, rel. to flares 3=11590
 - and u.v., and atmospheric structure 3=23686
 - 500-1000 Mc/s, spectral charact. of continuum 3=11588

Sun — contd

spectra

See also Sun, corona; Sun, flares; Sun, prominences.

- absorbance by atmosph. gases, calc. 3=18551
- absorptivity calc., ordinates selection 3=7031
- atmosphere, continuous absorpt. by quasi- H_2 mol. 3=5257
- chromosphere of sunspots, rel. to height 3=3574
- corona, condensation, three emission ratios and different temps. 3=18638
- corona, inner, meas. at eclipse 3=18636
- corona, u.v. radiation theory 3=9187
- correlations bet. vel. and brightness time vars. for different regions 3=11532
- extreme u.v., from space vehicles, review 3=14337
- extreme u.v., rel. to chromosphere—corona transition layer 3=16386
- faculae, contrast with photosphere 3=9194
- 4.75 μ , absorption by atmosph. O_3 3=18549
- Fraunhofer lines, Doppler widths, empirical inference 3=9224
- instruments and techniques in rockets, review 3=11531
- limb effect meas. for FeI, OI, NiI 3=9199
- lines and colour temp., photometry 3=18627
- monochromator for high order isolation 3=7345
- rare-earth line 3=19946
- red shifts, Freundlich's empirical formula 3=5254
- resonance, He II 304 A and He I 584 A, by rocket 3=11534
- simulation with filtered Xe lamp 3=5523
- u.v. and X-ray, rocket meas. 3=23685
- u.v., extreme, photoelec. spectrophotometry 3=9198
- u.v., two lines of neutral Si 3=9200
- X-ray emission, 4-14A, UK1 (Ariel) satellite results 3=16388
- X-ray, soft, satellite obs. 3=9152
- B Π lines, u.v., rel. to abundance 3=9195
- C abundance, automatic computation 3=13884
- CN red system, (2.0) and (3.1) bands 3=21107
- Fe lines at centre, rel. to departures from LTE 3=5253
- Fe II, gf values 3=9201
- H, α , β and γ lines, centre-to-limb variations 3=16371
- H line, rel. to quiescent prominences stability 3=16388
- H ϵ I, i.r. triplet line emission 3=5256
- K $_2$ and H $_2$ type absorption components 3=9197
- Mg b-lines, source functions 3=16369

Sunlight

See also Sky brightness.

- absorptivity, 0.3-3.0 μ , selected ordinates 3=7031
- attenuation by atmospherical aerosols, meas. 3=5202
- continuous recorder for six spectral areas 3=1446
- daylight colour from north sky 3=11407
- direct rel. to scattered, O_3 and water vapour absorption bands 3=9513
- earth surface temp., variation correl. 3=16189
- ice layer, attenuation, effect of inclusions 3=3439
- King Baudouin base, (1958-60) 3=11404
- Planck function for earth temps. 3=18511
- polarization, reflected from sea surface 3=9626
- recording thermistor radiometer 3=11408
- total radiation meas. during IGY 3=9042
- Uccle (Belgium) 1953, each hour 3=16221
- Uccle (1961) 3=11405

Sunspots

- activity, four-century cycle 3=9202
- areas and Wolf numbers, analytical relations 3=13885
- and atmospheric O_3 , comments on Willett 3=13659-60
- chromosphere nearby, Evershed velocities 3=3575
- chromosphere, rel. to pressure in sunspot 3=3574
- correl. with I_{F2} , variation between cycles 3=3503
- correl. with prominence activity 3=3583
- cosmic ray intensity correl., 1958-60 3=22245
- and cosmic rays, semidiurnal amplitude and phase 3=17374
- cycle, neglected?, from zonal wind osc., in equatorial stratosphere 3=9204
- cycle, rel. to v.h.f. backscatt. data 3=9080
- depths, observed, calc. by Wilson effect 3=3570
- distribution, axis of symmetry between two "royal zones" 3=16373

Sunspots — contd

- disturbances, catalogue, July 1961 3=18529
- and earth mag. field, variations, lack of relation with N-S difference 3=18575
- effective numbers, Jan.1961-July 1962 3=9205
- group of high activity, (July 1961) 3=11539
- hydromagnetic waves between spot pair 3=17034
- and ionosphere, F-region, ionization, diurnal variation peculiarities 3=18545
- latitude, effect on area during growth 3=21109
- longitudinal distrib., 1889-1954 3=11537
- mag. field, intensity and orientation from Zeeman effect, FeI, $\lambda 6302$ 3=18628
- magnetic field structure, obs. 3=11538
- magnetohydrodynamic stability of sub-photospheric tube of force 3=18629
- minimum, 1963-4 forecast 3=9203
- 1953-60 cycle, effect on F-region in ionosphere 3=13755
- north-south asymmetry, long-term 3=18631
- north-south asymm. rel. to mag. storm sources 3=18633
- north-south symmetry, rel. to hydrogen vortices 3=1521
- number of groups, analytic relations 3=5255
- rel. to ozone in atmosphere 3=13658
- penumbrae and effect of mag. field on granulation 3=3573
- photometry 3=18627
- photospheric granules, size near and away from penumbra
- physical states, two-component model 3=23684
- radiative transfer, theoret. calc. 3=1641
- radiofrequency (3-21 cm) emission 3=16424
- structure from absorpt. lines wings 3=16372
- subdivision, anomalous 3=18634
- secular variations in short-lived spots 3=9193
- umbræ, isophotal contour maps 3=13883
- umbral area and new model 3=21108
- unequal spottedness of two hemispheres 3=18632
- visibility on disk and E-W asymmetry of activity 3=3569
- and X-radiation, by rockets and satellite 3=11481
- zone of activity, longitudinal variation 3=7030

Superconductivity

See also Quantum theory, many-particle systems.

- absorption of ultrasound, theory 3=14444
- alloy, impurity effects and critical current 3=9679
- alloy, persistent currents theory 3=16870
- alloys, magnetization curve, near 2nd critical field 3=24141
- alloys, sound absorption 3=1899
- alloys, upper critical field 3=329
- anisotropic bodies, thermodynamics 3=7402
- antiferromagnetic, BCS electron pairs 3=9681
- in antiferromagnetics, possibility 3=16857
- asymptotic behaviour of perturb. expansions 3=7141
- Auger electron ejection by atom on superconducting target 3=9826
- Bogolyubov-Valatin transform., use of canonical form of antisymmetric tensor 3=3947
- Bogolyubov-Valatin transformation 3=19097
- book 3=325
- Bolometer, nonisothermal, 3=11997
- Bose condensate detection of Cooper pairs 3=1637
- boson-like behaviour of fermion pairs 3=14061-2
- bosons, interacting, microscopic approach 3=11730
- coexistence with ferromagnetism 3=16856
- coherence length effect on transitions 3=9673
- collective excitations, theory 3=5579
- conduction, a.c., lack of, theory 3=19102
- conduction electron spins, effect of uniform exchange field 3=24134
- criterion 3=5578
- critical current/mag. field, second kind 3=19112
- critical currents, 50 c/s 3=21661
- critical fields and currents 3=5584
- critical temperature detm. 3=19095
- critical temperature, rel. to impurities 3=19100
- Crowe cell device as computer store 3=340
- cryotron, crossed-film, obs. by amplifier, low noise, valve 3=21671
- current density eqn., gradient-invariant 3=19096
- current, metastability, temp. effects 3=21656
- cylinder, magnetic flux quantization 3=5585

Superconductivity — contd

D-band superconductors, orbital paramagnetism and Knight shift 3=336
 density matrix-pairing tensor eqns., soln. 3=16868
 destruction, effect of Joule heating 3=24140
 dielectric const., by BCS model 3=9676
 diffusion of supercond. backing into film 3=22805
 dirty, coherence length and penetration depth 3=12028
 electric current decay, BCS theory 3=1892
 electromagnet 3=14726
 electromagnet with supercond. wiring 3=2084
 electromagnetic cavity Q, 2856 Mc/s 3=19443
 electromagnets, field collapse 3=19409
 electromagnets, superconducting, Joule heating effects 3=12037
 electron Coulomb interaction effect 3=21652
 electron—lattice states of low energy props. 3=332
 electron tunnelling at junctions, excess currents 3=7408
 e.m. absorption, anisotropy effects, near threshold freq. 3=3944
 energy gap and density of states, by electron tunnelling through thin films 3=16869
 energy gap, mag. field depend., theory rel. to expt. 3=3945
 energy gap, meaning, with paramag. impurities 3=14439
 energy gap reduction in static mag. field 3=3948
 energy gap rel. to paramag. impurities 3=3953
 energy gap, review 3=10594
 energy gap, temp. depend., validity 3=21657
 Fermi fluid 3=23795
 fermion system, quantum vortices 3=16556
 ferromagnetics, ground state 3=19094
 and ferromagnetism 3=9672
 filamentary structures 3=16855
 filaments in imperfect crystals, elastic energy 3=5582
 film, solid, mag. moment 3=6688
 films, critical current and electron depairing 3=24136
 films, mag. effects, theories 3=14443
 films, susceptibilities and critical fields 3=9680
 films, switching time 3=5587
 films, vapour sources for vacuum deposition 3=9525
 fluctuation compressibility theorem 3=7136
 free fermions and bosons, linear response function 3=1628
 Green's function analysis 3=21651
 hard, flux creep, by tube mag. and resist. meas. 3=24133
 hard superconductors, critical field, upper limit 3=337
 hard superconductors, crit. persistent currents and flux creep theory 3=3951-2
 high-field alloys, max. critical field 3=1890
 high-field, review 3=12021
 high mag. fields, upper critical field 3=16879
 hollow cylinders, magnetic flux quantization 3=16859-60
 hydrodynamical theory, equivalence to Schrödinger—Maxwell eqns. 3=1612
 hysteresis, size effects, hard supercond. and crystal imperfections theory 3=19099
 impurities, non-mag., mean free path 3=7401
 intermediate state, fluctuation of resistance and resistance levels 3=1889
 interphase boundaries, thermal cond. and electron scatt. 3=24139
 Knight shift, rel. to spin-orbit interaction 3=5576
 layer, magnetic field sign reversal 3=16862
 limiting critical field, Ginzburg—Landau theory 3=16866
 London—Maxwell eqn., 2-dimensions, soln. uniqueness existence 3=7400
 long hollow cylinder, persistent currents, energetic stability 3=1891
 low-temp. conference, Kiev, Oct. 1961, papers included 3=24124
 magnetic flux quantization, Gorkov model 3=1896
 magnetization in critical supercond., meas. 3=5575
 magnet, Nb rings round Armco core 3=19410
 magnets, coils, electrical flux-pump power source 3=14463
 magnets, current prod., flux pump 3=17027
 magnets, electro. high-field, current carrying capacity 3=16881
 magnets, protection against overheating 3=14728
 magnets, review 3=17028
 magnets, review 3=24428

Superconductivity — contd

magnets, short wire tests 3=19407
 magnets, superconducting, review 3=339
 meas. of a.c. resistance, induction method 3=19126
 memory, quantized trapped flux applic. 3=24149
 metal films, rel. to defects 3=16133
 metals, change of transition temp. with press. 3=14461
 multiphonon effects in tunnelling between metals and superconductors 3=326
 Nernst heat theorem, Fermi—Dirac statistics 3=1626
 non-magnetic alloys, electron scatt. by impurities 3=9674
 normal metal film on supercond. films 3=5583
 normal metal—supercond. metal contact, elementary excitations in vicinity 3=12027
 nuclear spectrum, pairing interact., analogy 3=10215
 overlapping bands, energy gap and transition temp. 3=1893
 pairs in a relative p wave 3=21655
 phase transition, cylindrical superconductor, theory 3=9677
 phonon freq. and dielec. const. 3=19098
 Pippard and London superconductors, i.r. threshold absorption 3=1898
 quantized mag. flux "lines", motion 3=16861
 quantum phases, of-diagonal long range order 3=14436
 quasi-chem. equil. theory, self-consistency 3=14440
 quasi-particle lifetime at finite temp., thermal cond. ratio 3=331
 quasi-particle recomb. time, effect of electron m.f.p. 3=14441
 rare earth ferromagnetic metals, ultra-high field 3=3964
 relation to magnetic props. 3=14442
 resistance fluctuations in intermediate state 3=1889
 second kind, layer model 3=24138
 second random-phase approx. 3=12024
 second sound, thermal conductivity mechanism, exciton excitations 3=328
 second-type, rel. to large mag. fields and elec. currents 3=5577
 solenoid, Nb—Zr, high field 3=3971
 solenoids, control of d.c. mag. fields 3=14723
 solenoids, fluctuations in critical current/external field relation 3=1889
 specific heat, anomaly at supercond. transition 3=14445
 specific heats, rel. to electron—phonon interact. 3=3950
 spin effects, treatment of non-mag. impurities 3=3946
 strip conductors with rt.-angle bend 3=9712
 superconductors pure thermal conductivity and sound absorption 3=330
 superconductors as permanent magnets 3=338
 superconductors as permanent magnets 3=14464
 supercurrent destruction by α -particles, qualitative mechanism 3=12026
 spin ordering in ferromag. supercond. 3=12023
 temperature controller, below 1°K 3=1880
 theory, adiabatic approx. methods 3=5580
 theory, props. of modified electron—lattice states of low energy 3=332
 thermal conduction, intrinsic electronic theory 3=5581
 thermal conductivity 3=21650
 thermal switch, anisotropic 3=16882
 thermal wire, var. with dia., and m.f.p. 3=22672
 thermodynamics, Coulomb interaction calc. 3=21653
 thin films, magnetic moments and critical fields 3=24142
 thin films, shape resonances 3=19101
 transient effect on supercond. sphere in mag. field 3=16865
 transition metal alloys, upper crit. fields 3=3949
 transition-metal solid solutions, magnetic props. 3=15747
 transition metal solns., size factor 3=16871
 transition metals, specific heats meas. 3=7405
 transition metals, s—d interaction 3=5593
 transition metals, two-band model 3=9678
 transition of films, fluxoid quantiz. effects 3=9675
 transition temperature, rel. to isotopic composition 3=24135
 transition temps. and abs. boiling points, empirical laws 3=24132
 transition temps., structures, of metals, alloys 3=14438
 tunnelling between normal metal and superconductor, function tables 3=16863
 tunnelling, by electron pairs, new effects 3=1895

Superconductivity — contd

- tunneling current, calc. 3=16858
 tunnelling effect 3=1894
 tunnelling, effect of microwave field, multiphonon process 3=5595
 tunnelling, Josephson, self-field limiting, electron pairs 3=21659
 tunnelling, mag. controlled, 3-terminal superconductor-insulator-metal device 3=24151
 tunnelling process, two-particle 3=7409
 tunnelling, thin dielectric layer separation, temp. depend. 3=19103
 two-particle tunnelling processes 3=16864
 u.s. absorption anisotropy 3=5586
 u.s. attenuation for $q\ell < 1$, calc. 3=21654
 AgTe, 1.3° to 20° K 3=16873
 Al, attenuation of u.s. shear waves 3=14446
 Al-clad Pb wire, magnetic transitions 3=9682
 Al, critical temp., containing Cr, Mn, Fe impurities 3=19105
 Al films 3=14447
 Al films, rel. to adsorbed O 3=16872
 Al, specific heat near transition point 3=12029
 Al, up to 1 at.% impurities, forbidden band anisotropy, from specific heat, temp. var. 3=19106
 Al-Al₂O₃-Sn junctions, tunneling currents, zero voltage, microwave effects 3=21660
 Al-Ca-Si, 1.3° to 20° K 3=16873
 Al-Ge, 1.3° to 20° K 3=16873
 Al-In films, crit. temp. increase on exposure to water vapour 3=19107
 Al-Pd-Mo, 1.3° to 20° K 3=16873
 Al₂Ca, 1.3° to 20° K 3=16873
 Al₄Ca, 1.3° to 20° K 3=16873
 Al-Pb tunnelling characteristic, phonon spectrum image 3=24146
 Al₃Y₂, 1.3° to 20° K 3=16873
 As₂Pd₃, 1.3° to 20° K 3=16873
 AsW, 1.3° to 20° K 3=16873
 AsZn, 1.3° to 20° K 3=16873
 Au films, critical temperature rel. to electrostatic charging 3=15545
 AuSb₂, 1.3° to 20° K 3=16873
 AuTe₂, 1.3° to 20° K 3=16873
 BCS state, current-carrying, Byers-Yang method 3=24137
 BCS theory, review 3=12025
 BeCr₂, 1.3° to 20° K 3=16873
 Be₂Mo, 1.3° to 20° K 3=16873
 Be₂Re, 1.3° to 20° K 3=16873
 Be₂W, 1.3° to 20° K 3=16873
 Be₂Zr, 1.3° to 20° K 3=16873
 Be₁₃Mo, 1.3° to 20° K 3=16873
 Be₁₃Zr, 1.3° to 20° K 3=16873
 Bi II and III modifications, critical fields 3=21662
 CaSi, 1.3° to 20° K 3=16873
 CaSi₂, 1.3° to 20° K 3=16873
 Ca₂Si, 1.3° to 20° K 3=16873
 Ca₃Ge, 1.3° to 20° K 3=16873
 Cd, isotopes 3=12030
 Cr alloys with Ru, Rh, Ir 3=1900
 Cu-Pb, thermal boundary resistance 3=19108
 Cu-Pb-Cu sandwiches, thermal cond. at liq. He temp. 3=24150
 Cu-Sn, thermal boundary resistance 3=19108
 Fe, films, no evidence 3=19109
 FeSb₂, 1.3° to 20° K 3=16873
 Ga-Pt, 1.3° to 20° K 3=16873
 Ga₂Zr, 1.3° to 20° K 3=16873
 Ge₂Pd, 1.3° to 20° K 3=16873
 Hf-Nb alloy, high mag. field transitions 3=16879
 Hf-Ta alloy, high mag. field transitions 3=16879
 Hg, energy-gap functions, theory 3=16867
 Hg films, freshly deposited 3=327
 Hg-In alloys, transition temp. 3=14453
 In alloys, ideal transition, concn. limits 3=7403
 In-Bi (3 at. %), thermal cond., 2.16°K, var. mag. field 3=12032
 In-2½% Bi, magnetization rel. to field strength 3=3954
 In cylinder, mag. fld. penetration, rel. to ohmic dissipation 3=24144

Superconductivity — contd

- In, films, critical temperature rel. to electrostatic charging 3=15545
 In films, rel. to adsorbed O 3=16872
 In films, rel. to residual gases 3=16878
 In films, structure in density of states 3=24143
 In, Kapitza resistance 3=311
 In-Pb alloys, magnetic field penetration 3=9683
 InSb, metallic form 3=12031
 InSb, transformation temperature 3=19110
 In-Sn alloy films, critical mag. field 3=14448
 In-Sn alloys, magnetic field penetration 3=9683
 In-Sn system 3=19111
 In-Tl alloys, magnetic field penetration 3=9683
 K₂Te₃, 1.3° to 20° K 3=16873
 Mo, critical mag. fields 3=3959
 Mo, energy gap and critical field, by u.s. meas. 3=3958
 Mo, isotope effect on transition temp. 3=7404
 Mo₂Ir, isotope effect on transition temp. 3=7404
 Mo-Re alloys, anisotropy w.r.t. mag. field 3=14452
 Mo-Re wires, critical currents 3=14454
 Mo-Tc system, phases 3=19113
 NaTe, 1.3° to 20° K 3=16873
 Na₂Sb, 1.3° to 20° K 3=16873
 Nb, energy gap, by electron tunnelling 3=333
 Nb, high field transition 3=19114
 Nb, magnetization curve meas. 3=11066
 Nb, negative surface free-energy effects 3=3961
 Nb single crystal, mag., thermal props. 3=5589
 Nb, very pure, transition temp. 3=22662
 Nb₃Al, evidence for negative surface energy models 3=5591
 Nb₃Al, negative surface energy, rel. to mag. props. 3=14452
 Nb₃C, establishment, down to 1.98°K 3=7406
 Nb(Ga, In, Sb)₃Sn_{1-x}, zero field transition curves 3=3960
 Nb_{0.30}Mo_{0.70} alloy, 0.016°K zero field transition 3=21665
 Nb-Ru alloys, transition temp. 3=22662
 Nb-Sn films, diffusion, prep. and props. 3=19118
 Nb-Sn-Ge, 1.3° to 20° K 3=16873
 Nb-Sn wire, microstructure exam. 3=13586
 NbSn₂ 3=5592
 Nb₃Sn 3=14458
 Nb₃Sn, critical, current density meas. 3=5575
 Nb₃Sn, effect of adding Ag on crit. parameters 3=19117
 Nb₃Sn, evidence for negative surface energy models 3=5591
 Nb₃Sn films, critical current, temp. and mag. field var. 3=19120
 Nb₃Sn hollow cylinder in pulsed mag. fields, up to 8.2 kG 3=19116
 Nb₃Sn, jump of thermal expansion at transition 3=16875
 Nb₃Sn magnets, short wire tests 3=19408
 Nb₃Sn, negative surface energy, rel. to mag. props. 3=14455
 Nb₃Sn, prep. 3=5590
 Nb₃Sn solenoids, critical current rel. to magnetic field 3=3968
 Nb₃Sn strip 3=21664
 Nb₃Sn, theory of tunnelling expts. 3=12027
 Nb₃Sn, thin surf. layer, mechanical stress effects 3=1903
 Nb₃Sn, transition temp., compression and isotope effects 3=16874
 Nb-Ta alloys, upper crit. field, temp. depend. 3=19119
 Nb-Th alloy, as high-field high-current superconductor 3=14457
 Nb-Ti alloys, upper crit. field, temp. depend. 3=19119
 Nb-25% Zr wire, normal region propag., effect of Cu plating 3=14456
 Nb-Zn-Sn, 1.3° to 20° K 3=16873
 Nb-Zr alloy at 9250 Mc/s 3=21666
 Nb-Zr alloy, Hall coefft. 3=13043
 Nb-Zr alloys 3=19115
 Nb-Zr alloys, anisotropy w.r.t. mag. field 3=14452
 Nb-Zr alloys, critical currents in mag. field 3=21667
 Nb-Zr alloys, u.s. attenuation, oscillatory behaviour 3=12035
 NbZr, critical current depend. on dI/dt 3=12034
 NbZr electromagnet 3=19409
 Nb-Zr-In, 1.3° to 20° K 3=16873
 Nb-Zr solenoid, operation in 400 MeV proton flux 3=3970
 Nb-Zr solenoid, persistent current obs. 3=9685
 Nb-Zr solenoids, current-carrying capacity 3=3969
 Nb-Zr solenoids, remanent mag. fields 3=14459

Superconductivity — contd

- Nb—Zr solenoids, transition to normal state 3=21670
 Nb—Zr wires, critical currents 3=14454
 3Nb—Zr, critical, current density meas. 3=5575
 Ni, surface electrical losses, in l.f. fields 3=12033
 NiP, 1.3° to 20°K 3=16873
 NiSb₃, 1.3° to 20°K 3=16873
 Ni—Zr, crit. current, effect of annealing temp. 3=14460
 Ni—Zr solenoid, 8.8 kG 3=7678
 Os—Ir solid solns. 3=3962
 Os, isotope effect meas. 3=19121
 Pb alloy, critical current/mag. field, imperfection effects 3=19112
 Pb-base alloys, magnetic properties 3=9684
 Pb-base solid solutions 3=14449
 Pb—Bi, a.c. loss 3=3956
 Pb, crit. fields, effect of cold working at 78°K 3=5588
 Pb, crit. field, effect of neutron irradiation, at 78°K 3=14451
 Pb, energy-gap functions, theory 3=16867
 Pb, energy gaps, by electron tunnelling 3=333
 Pb films, rel. to adsorbed O 3=16872
 Pb films, rel. to residual gases 3=16878
 Pb films, vapour sources for vacuum deposition 3=9525
 Pb hollow cylinder, frozen-in mag. flux 3=12022
 Pb, injected electron capture lifetime 3=14450
 Pb, interphase surface energy parameter at 4.2°K 3=1902
 Pb, magnetic field noise, Barkhausen type 3=24147
 Pb ring, trapped-flux decay, rel. to irradiat. 3=3955
 Pb, specific heat, 0.3°–4°K 3=10601
 Pb, surface electrical losses, in l.f. fields 3=12033
 Pb, tunneling current, calc. 3=16858
 Pb—Sb, tunnelling characteristic, phonon spectrum image 3=24146
 Pb—Sn and Pb—Cd, effects of pptn. 3=24145
 Pb—Ti crystals, quasi-reversible mag. behaviour 3=3957
 Pd cobaltite- and pyrite-type compounds, > 1°K 3=21663
 Pt cobaltite- and pyrite-type compounds, > 1°K 3=21663
 Pt-metal compounds, new superconductors discovered 3=24148
 Re, change of transition temp. with press. 3=14461
 Rh, absence of isotope effect 3=3963
 Rh₁S₁₀, crystal structure 3=8841
 Rh—Ti alloys, transition temp. 3=21669
 Rh—Zr alloys, transition temp. 3=21669
 Sn, bulk, tunnel effect 1.36°–3.6°K 3=1901
 Sn cylinder in mag. field, resistant/current var. 3=21658
 Sn, energy gap, by electron tunnelling 3=333
 Sn film, normal—superconducting phase boundary, thermal propagation 3=16877
 Sn, films, critical temperature rel. to electrostatic charging 3=15545
 Sn films, destruction by current pulses 3=3966
 Sn films, hysteresis in phase transitions 3=9687
 Sn films, mag. moment. 3=6687
 Sn films, mag. transitions 3=19124
 Sn films, rel. to adsorbed O 3=16872
 Sn films, rel. to residual gases 3=16878
 Sn films, vapour sources for vacuum deposition 3=9525
 Sn, Kapitza resistance 3=311
 Sn, microwave effects, nonlinear, and switching speed 3=19123
 Sn oxide, tunneling, anomalous d.c. 3=14462
 Sn, surface tension between normal and supercond. phases 3=5594
 Sn thin films, crit. current density rel. to temp. 3=3965
 Sn, transition temp., effect of nonmag. impurities 3=16876
 Sn, transition temp., effect of Sb impurities and plastic deform. 3=19125
 Sn—Pb detector, for mag. field meas. 3=468
 Ta, energy gap, by electron tunnelling 3=333
 Ta—(55 at.%)Nb, second kind, current capacity 3=19122
 Ta₃C, establishment, down to 1.98°K 3=7406
 Ta—Ti wires, critical currents 3=14454
 Tc, transition temperature 3=334
 Ti—Mo alloy, high mag. field transitions 3=16879
 Ti—Mo, high-field props. 3=9686
 Ti—Nb alloy, high mag. field transitions 3=16879
 Ti—Rh alloys, crit. temp., influence of lattice structure 3=7407
 Ti—Rh alloys, transition temp. 3=21669

Superconductivity — contd

- Ti—Ta alloy, high mag. field transitions 3=16879
 Ti—V alloy, high mag. field transitions 3=16879
 Tl films, rel. to adsorbed O 3=16872
 Tl, transition temp., pressure depend. 3=21668
 Tl, transition temp., rel. to lattice defects 3=12036
 U—Mo alloy, high mag. field transitions 3=16879
 U—Nb alloy, high mag. field transitions 3=16879
 u.s. absorption, anisotropy effects, near threshold freq. 3=3944
 V, films 3=19109
 V, thermal conductivity 3=1904
 V₂C, establishment, down to 1.98°K 3=7406
 V₃Ga, evidence for negative surface energy models 3=5591
 V₃Ga, negative surface energy, rel. to mag. props. 3=14455
 V—Si, V—Ga films, diffusion, transition temp. 3=16880
 V₃Si films, rel. to filamentary theory 3=3967
 V₃Si, effect of elements replacing V 3=335
 V₃Si, evidence for negative surface energy models 3=5591
 V₃Si, negative surface energy, rel. to mag. props. 3=14455
 V₃Si, V₃Ga wires, transition temp. 3=16880
 W—Be, 1.3° to 20°K 3=16873
 W—Pt solid solns 3=3962
 Zr—Nb alloy, high mag. field transitions 3=16879
 Zr—Re, 1.3° to 20°K 3=16873
 Zr—Rh alloys, transition temp. 3=9688
 Zr—Rh alloys, transition temp. 3=21669

Supercooling

- alloys, crystallization 3=21624
 glass formation, suitable liquid structures 3=9443
 liquids, by dispersion as emulsion, small volumes 3=16837
 melts, nonadiabatic crystallization, one-dim. analysis 3=21625
 salt solutions, dispersion as emulsion, small volumes 3=16837
 water, dispersed as emulsion, small volumes 3=16837
 Ga's, Te-doped, rel. to facet formation 3=12980
 K films, evidence from optical props. 3=25437
 Sn, nucleation catalysis, statistics to be used 3=21621-2

Superfluidity

- See also Helium, liquid; Quantum theory, many-particle systems.
 Bose system, with repulsive delta function potential 3=14059
 bosons, interacting, microscopic approach 3=11730
 condensate of weakly interacting bosons 3=11729
 condensed systems, functional methods 3=14054
 Cooper effect in low-density Fermi gas 3=3940
 kinetics of destruction in He 3=1884
 Landau theory, rel. to system—wall interact. 3=9668
 nuclear matter. 3=19742
 nuclear matter, single-particle energies, reference spectrum method 3=24831
 variational theory in terms of "observables" 3=11719
 He, film flow at low pressure heads 3=313
 He, in narrow channels, electrohydrodynamics 3=312
 He II and luminescence, due to α 's, inhibition below λ point 3=21644
 He II, critical velocity, rel. to vortex ring energy 3=3938
 He II, friction with normal component 3=21645
 He II, temp. discontinuity at metal boundary 3=5570
 He³, Cooper effect 3=5569

Supersonic flow

- See also Shock waves.
 adiabatic, transonic, entropy method. 3=163
 air, heat transfer, circular pipe with large temp. differences 3=14193
 around bodies of revolution, variational problems 3=1717
 around thin blunted power-law shapes 3=16644
 conical gas flow, shock-wave analysis 3=159
 conical, shock-wave higher-order approx. 3=159
 delta wing, flow past 3=162
 dissociated, local atom concn., probe theory 3=9487
 gases, viscous and heat-conducting, hypersonic flow. 3=160
 hypersonic, interact. with mag. field 3=18901

Supersonic flow — contd

- for isotope separation 3=5459
- magnetohydrodynamic flow past wedge 3=24451
- meas., pitot tube, performance, rarified flow 3=14197
- reflectn. from sonic line, shock wave formatn. 3=196
- reflectn. from sonic line, shock wave formatn. 3=5489
- rotational hypersonic flow, 3-dimens., Cauchy problem soln. 3=16645
- similarity parameters, at high speeds 3=16643
- singularities, past bodies of revolution 3=18778
- supersonic stream—transverse sonic jet interaction 3=7229
- through nozzles, variational problems 3=1717
- transonic flow in throat or nozzle. 3=158
- transonic gas flow, plane, with singularities on sonic line 3=161
- transonic pressure fluctuations 3=23923

Supersonics

See Ultrasonics.

Surface energy

- and adsorption 3=23517-18
- alkali halide crystals, (100) faces, calc. 3=20073
- atomic collisions, lattice waves, impurity effects 3=25769
- binary metal solns., statistical electron theory 3=23485
- fluorite-structure crystals, {110} face 3=22632
- metal films, growth, effect of energy on crystallite size 3=16134
- metal foils, electron theory, thickness depend. 3=10573
- use of $1/\gamma$ plot in thermal etching theory 3=23384
- Ge, for various planes, cleavage meas. 3=25177
- KCl, defect formation, high temp. processes 3=20214
- KCl, {100} planes 3=25178
- LiF, defect formation, high temp. processes 3=20214
- NaCl, defect formation, high temp. processes 3=20214
- Si, for various planes, cleavage meas. 3=25177

Surface ionization

See Ionization, surface.

Surface measurement

See also Area measurement.

- Brunauer—Emmett—Teller area, using adsorption 3=5145
- distortions, Moiré fringe method, errors 3=1829
- flatness testing, using air gauging 3=7164
- flatness, using optical spherical aberr. 3=16566

Surface phenomena

See also Adsorption; Capillarity; Catalysis; Electron emission; Films; Ionization, surface; Liquid waves, surface.

- alkali halides, distortion at surface, and within first 5 layers 3=25768
- carbon-tantalum system, migration 3=14622
- charge in space-charge region of semicond. 3=22913
- charge, on deformation, LiF crystals 3=6773
- conference, Moscow (1960) 3=23498
- contact thermal resistance, reduction of 3=24083
- counters, semiconductor, surface-barrier, protection, against Hg vapour in vac. pumps 3=22043
- crystal excitons, "mechanical", optically active crystals, e.m. excitation 3=20140
- deformation, using photoelastic coatings 3=13320
- diffusion of Ag in Ag, Ni, Au 3=20232
- diffusion, review 3=17780
- discharge, electric, on dielectric, critical field intensity 3=24265
- drops, movement in liquids, due to 3=5426
- electrical double layer, mech. vibr. effects 3=12065
- electron ejection, Auger from solid surfaces, apparatus for studying 3=14619
- and flow, water, in canals 3=9431
- fracture, brittle bodies, time depend., in surface active media 3=25642
- glass, etched, defects development 3=11314
- glass, rel. to toughening by heat treatment 3=3229
- heat conduction, at bonds, between sheet materials, use in testing 3=13984
- heat conduction between two rough surfaces 3=16821
- heat transfer, rough 3=16817
- ice, structure, criticism 3=14139
- liquid (Hg), spreading on Zn effect of surface texture 3=5427
- liquid interfaces, eruptions interpret. 3=1671

Surface phenomena — contd

- liquid—liquid phase boundaries, rel. to coalescence of 2 Hg hemisphere 3=23865-6
- liquid, surface profile when rotating 3=23845
- metal bombard. by inert gas ions and atoms, energy transfer 3=22511
- metal, double layer, dipole moment 3=15470
- metals, mag. props., from ortho—para H conversion 3=1128
- metals, nearly perfect, preparation methods review 3=23500
- metals, plasmon oscills., foil, dispersion calc., semi-classical hydrodynamic 3=22690
- perovskite ferroelectrics, acoustic and X-ray excitation of anomalous layers 3=22993
- polymer chains at interface, configurational props. 3=15404
- scattering, Ar ions, 30 keV, ang. distrib., on graphite Cu, W 3=5720
- scattering by nearly-polished surface 3=21568
- semiconductors, charge and potential 3=13049
- semiconductors, diamond-type, clean (111), free bonds 3=10748
- semiconductors, i.r. transmittance meas. 3=13557
- semiconductors, power 3=2858
- semiconductors, props. meas. in waveguides 3=19454
- semiconductors, zinc-blende type, barriers Fermi level rel. to band gap 3=20134
- silica-alumina, i.r. study 3=11313
- solid, surface energy, effect of surface-active medium 3=6879
- solids, stress analysis by differential geometry 3=21271
- specific heat of solids 3=6475
- spectrochemical analysis, metals, by spark, h.f. 3=25844
- surface potl., electrostatic voltmeter 3=7419
- suspensions, colloidal, lamellar, ion exchange 3=11364
- thermal accommodation coefft. theory 3=6882
- trapping in atomic collisions with crystal surface 3=8923
- water, structure, criticism 3=14139
- Ag films, transition radiation energy loss 3=10633
- Ag, self-diffusion 3=22821
- Ag, self diffusion and faceting 3=25292
- Al, bombard. by Zr ions at ~ 10 keV 3=4219
- C, amorphous, e.s.r. line-widths, rel. to O 3=3168
- CaCO₃ (calcite) and electrode potential 3=8968
- CdS_xSe_{1-x}, photo-e.m.f., vert. illum., spectrum, var. with x 3=23015
- Cu, bombard. by Sn, Zr and Mg ions at ~ 10 keV 3=4219
- Cu, oxidation, dislocations, effects 3=16130
- Fe, vacuum annealed, self-diffusion 3=13003
- Ge cathode in 2 mol HCl electrolyte, surface states 3=17689
- Ge, changes in elec. props. on etching in H₂O₂ 3=2899
- Ge, cleaved; gas evolution, conductivity, and V—I characteristics 3=10782
- Ge, cleaved surfaces 3=23383
- Ge crystal defect recomb. with adsorpt. of polar liquid mols. 3=22709
- Ge—electrolyte interface, surface states 3=10780
- Ge, energy levels, optical study 3=2989
- Ge, fast states, effect of water mols. 3=20138
- Ge, n-type, fast-states structure 3=6584
- Ge reactions with O and I 3=13555
- Ge, surface cond. after exposure to oxygen 3=4174
- Ge, surface potential inhomogeneities; electron mirror obs. 3=10783
- Ge, surface states, cleaned and oxidized 3=17856-7
- Ge transistors, effects of vacuum drying 3=2942
- Ge—NaOH solution interface, conductance 3=10781
- H, atomic, recombination on Pt 3=20987
- InSb surfaces, O₂ association, rel. to yield drop 3=13353
- Mg, oxide film formation 3=23512-13
- NaCl, cleaved, evaporation decoration by Ni, Permalloy films 3=20931
- NaCl, effects of elec. discharge 3=13558
- NaCl, evaporated films, sintering, surface smoothing, loss of surface area 3=25777
- Ni oxides, layers on Ni at 900°C in air, X-ray diffr. exam. 3=16129

Surface phenomena — contd

- Ni, superconducting, surface electrical losses, in i.f. fields 3=12033
- Pb, superconducting, surface electrical losses, in i.f. fields 3=12033
- PbO, photoconductivity, in n-PbS-p-PbO films, in Resistor charge-storage tubes 3=25419
- PbS, potential, changes on illumination 3=20414
- Sb, diffusion on Ge, 250-650°C 3=20223
- Se films containing S, photoelectrets, depolarization 3=23006
- Si, cleaved surfaces 3=23383
- Si, diffusion in Ni 3=6539
- Si, photoelectric emission and work function 3=9833
- Si, surfaces potential inhomogeneities; electron mirror obs. 3=10783
- SiO₂, adsorption of hydroxyl groups, spectrum and heat vars. 3=8922
- SiO₂, elec. conductivity, due to adsorbed molecules 3=25318

Surface tension

- See also Capillarity.
- and absorption, acoustic waves, u.s., liquids containing glass "microballs" 3=16621
- adsorption systems, three-phase, contact angle 3=23519
- conducting droplet under action of surface tension and e.s. forces 3=14503
- conference, Moscow (1960) 3=23498
- as double-layer phenomenon 3=23854
- n-hexane, effect of N₂ and Ar, 1-120 atm 3=18795
- iron, and contact angle, var. with P,S content, 1560°C 3=11775
- liquid layer between sphere and plane surface 3=23860
- liquid, rotating, effect on surface profile 3=23845
- metals and alloys, molten 3=121
- metals and heat of vapourization 3=21602
- metals, liquid, depend. on temp., calc. 3=7194
- methanol, effect of Ar adsorption, 1-120 atm 3=18795
- n-octane, effect of Ar adsorption, 1-120 atm 3=18795
- solids, interphase surface 3=11198
- statistical mechanics, rel. to curvature 3=14052
- temperature dependence 3=14129
- two fluids between parallel plates, dynamic contact angle meas. 3=1672
- water, effect of N₂ and Ar, 1-120 atm 3=18795
- Ag, effects in small crystals 3=18062
- Cu, sessile drop, optical meas. 3=16598
- He³-He⁴ liquid mixtures 3=24131
- Hg solutions, temp. depend. 3=21340
- In-Ge alloys, molten, rel. to content 3=21335
- Nd, by bubble pressure, 1030-1186°C 3=5425
- Pb solutions, temp. depend. 3=21340
- Sn solutions, temp. depend. 3=21340

Surface tension measurement

- adherent drop method, data analysis 3=23852
- contact angles, solid-liquid, meas. 3=11774
- surface and interfacial, techniques 3=11776
- Sn, between supercond. and normal phases 3=5594
- Ti, liquid, electron bombardment drop wt. method 3=23853

Surface texture

- brass, roughness, meas. by adsorption of I¹³¹ 3=13556
- clean surfaces prod. in high vacuum 3=23499
- condensation of water vapour, effect on 3=21635
- contact error between repeatedly wrung surfaces 3=25770
- crystal, study by Berg-Barrett method 3=25660
- crystals, nearly perfect, examination methods review 3=23500
- effect on spreading of liquid Hg, for Zn 3=5427
- electrodes, in pulsed discharge, pitting 3=21722
- glass, polishing effect 3=18373
- glass, rel. to attack by ionic bombardment 3=17810
- graphite, cleaved surfaces 3=3261
- heavy metals, rel. to electron diffraction by reflection 3=18403
- ice 3=21307
- ice crystals, surface structure 3=18260
- metals, rel. to heat radiation 3=7385
- metals, roughness meas. by adsorption of I¹³¹ 3=13556
- paper, under rolling pressure 3=13553
- polishing, electrolytic, Cu in H₃PO₄, diffusion phenomena 3=11351

Surface texture — contd

- quartz powders, disturbed surface layers 3=16128
- rough, analysis by Doppler-scattering 3=18374
- soda-lime glass, lines, rel. to etching 3=18375
- specimen current image examination 3=23531
- topography, interference microscopy meas. 3=14324
- water 3=1307
- Ag crystals, effect of annealing, Ar-ion bombard. 3=20435
- Ag₂Te evap. films 3=833
- Al, roughness, meas. by adsorption of I¹³¹ 3=13556
- Au, roughness, meas. by adsorption of I¹³¹ 3=13556
- BeO, hot pressed, pressure-dependent basal plane texture 3=25648
- CdS, electron micr. study 3=8924
- Co-CW alloy, abrasion, surface fracture 3=5075
- Cu and electrographite, changed during friction 3=6807
- Fe, cold-rolled, primary recryst. texture 3=18353
- Fe-Ni alloys, corrosion layers 3=20913
- Ga, strain-free, construction method 3=25772
- Ge, clean (100) and (111) surfaces 3=13554
- Ge, electropolishing technique 3=23501
- Ge films, roughness 3=25771
- Ge films, triangular patterns 3=20925
- Ge, for epitaxial substrates 3=6880
- In-Pb alloys, corrosion layers 3=20913
- KBr, melt grown ingots 3=23502
- LiF, fission fragment damage, surface structures 3=22863
- Ni, effect on ferromag. reson. line width 3=1172
- PbTe, chemical polish 3=6881
- Pt-Al₂O₃ catalyst, 30J° 1300°C 3=18367
- Pt-C films, by electron diffraction 3=1370
- Si abraded surfaces, electron microscope study 3=3353
- Si, clean (100) and (111) surfaces 3=13554
- Si, electropolishing technique 3=23501
- Si, rel. to abrasion 3=18219
- Sn, crystallographic features 3=18341
- W microcrystals, up to 60 Å diam. 3=3296
- W, ordered surface, thermal rearrangement 3=18376

Suspensions

See also Aerosols; Sedimentation; Sols.

- Ag halide, particle size change with time. 3=25839
- attapulgite in water, theory of flow props. 3=11362
- collodion-water, with air bubbles, u.s. absorpt. 3=14262
- colloidal, lamellar, ion exchange on 3=11364
- diffusion and viscous flow, thermodynamics 3=8984
- disperse systems, ionization equilibrium 3=21696
- flow, momentum, mechanical-energy balance eqns. 3=101
- fluidized beds, multistage, particle residence times 3=16585
- fluidized beds, structure det. 3=16586
- laminar, orientation in Stokes' flow 3=9429
- light absorpt. and scatt. interaction, large coloured particles 3=9621
- light reflections, Bragg, and crystallization 3=13622-3
- light scattering, haloes theory 3=21567
- liquid, heat transfer, critical eqn. 3=19039
- polydisperse systems, ultracentrifuge centre-piece 3=3420
- polyvinyl acetate, light scatt., absorpt. 3=11941
- rubber latex, particle size distrib. 3=6931
- spheres, polymethylmethacrylate, macroscopic, dilute, viscosity, non-Newtonian 3=18788
- viscosity, aggreg. and liq. penetration effects 3=11360
- X-ray scatt., small-angle, rel. to size distrib. 3=18402

Symbols

See Nomenclature and symbols.

Synchrotrons

See Particle accelerators, orbital.

Tables, mathematical

- matrix elements for operators $O_3^{\pm 1}$, $O_4^{\pm 2}$, $O_6^{\pm 1}$, $O_6^{\pm 2}$ 3=18691
- Whittaker functions 3=13995

Tables, physical

See Collections of physical data.

Tachometers

See Angular velocity measurement.

Tantalum

- anodic film, structure 3=23507
 anodization, radio tracer study by Cl^{36} and S^{35} 3=25830
 band structure from X-ray spectra 3=4979
 brittleness, due to H, influence of absorbed N and rate of deformation 3=6804
 carbon-Ta system, field emission 3=14622
 charging of Al_2O_3 and NaCl by rubbing with Ta wire 3=2966
 doping of AlSb, high resistivity effect 3=13068
 elastic consts., 4.2°-300°K 3=13325
 electron emission due to Ar^+ bombardment 3=9843
 electron emission, secondary, energy distrib., on electron bombardment at 100-1000 eV 3=12240
 electron emission, secondary, with thermal emission current 3=24343
 electron secondary emission, by He^+ bombardment 3=21862
 energy band structure by isochromat meas. 3=15468
 films, vacuum deposition, using spring-loaded conductors 3=9524
 hardness, effect of electrolytic H 3=3245
 internal friction peak, low-temp., amplitude-dependence 3=18167
 internal friction, rel. to interstitial-dislocation interaction 3=23292
 plastic flow transition temperature 3=11163
 resistivity rel. to plastic deform 3=13037
 secondary electron emission, 1 MeV proton bombardment 3=24344
 sound velocity, effect of high mag. field 3=8356
 specific heat, 1200°-2400°K 3=10596
 superconducting energy gap, by electron tunnelling 3=333
 tensile yield stress, effect of strain-rate 3=1237
 thermionic emission, in Cs vapour, low coverage, discontinuity 3=14624=5
 welding 3=18685
 CO adsorbed, field emission 3=14623
 Ta-anodic oxide film-metal counter-electrode, dielec. props. 3=17930
 Ta⁷⁷, X-ray spectra, L emission, quadrupole and forbidden lines 3=12766

Tantalum compounds

- anodic oxide films, structure 3=3355
 Ta-(55 at.%)Nb, superconductor, second kind 3=19122
 TaB, crystal structure, rel. to similar types 3=18338
 TaB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121
 TaB₂, thermoelectron emission 3=7631
 Ta-C, electrical resistivity, rel. to composition 3=25368
 TaC, thermionic emission, 1300°-1900°K 3=16974
 TaC, W diffusion 3=25295
 Ta₂C, supercond. invest. down to 1.98°K 3=7406
 Ta₂Cl₁₂⁴⁺, bonding 3=8281
 Ta-H system, internal friction 3=18168
 Ta-Ni, structure of W₆Fe₄ type 3=16093
 Ta₂O₅, p-i-p junctions, rectification and e.m.f. 3=10849
 Ta₂O₅, in Ta-Ta₂O₅-Au diodes, electron transport mechanisms 3=6611
 Ta-Re, paramag. susceptibility, rel. to temp. 3=999
 Ta-Ti wires, supercond., critical currents 3=14454
 Ta-W, paramag. susceptibility rel. to temp. 3=999
 Ta_{0.8}Zr_{0.2}C, thermionic emission, 1300°-1900°K 3=16974

Teaching

- AAPT - AIP Regional Counselor Program (USA) 3=6
 acceleration of gravity apparatus 3=11658
 acoustics, methods of attracting physics students 3=9319
 anisotropic defects in solids, stress effects 3=22695
 anthropological angle 3=23724
 apparatus for hexamethylenetetramine crystal growth 3=23400
 apparatus for three lecture demonstrations 3=3703
 astronautics 3=11660
 atoms and radiative processes, quantum-mech description 3=12747
 calculus, changes in undergraduate courses 3=5315
 Carnot cycles, diagram for 3=21639
 centripetal force apparatus 3=11655
 chain reactions, analogy with vibrating systems 3=4680
 Commission on College Physics, review conference 3=5314

Teaching — contd

- commission on College physics (USA), progress report 3=3
 "dynamation", defin. and proposal of word 3=3775
 electric field of charge moving in medium 3=21938
 electricity and magnetism, first-year 3=12038
 electromagnetic induction 3=14737
 electron diffraction, lecture demonstration 3=4201
 electrostatic and Fermi potentials, with applications 3=341
 electrostatic field bet. parallel plates, meas. 3=14502
 Fabry-Perot interferometer and its use 3=260
 Faraday's and Ampere's laws, rel. to Maxwell's eqns. 3=14738
 graduate training of eminent physicists, top institutions 3=21190
 gyroscope, demonstration 3=11741
 independent study course with computer 3=11657
 institutions not granting Ph.D. (USA) 3=5
 Kepler's third law, without calculus 3=13850
 kinetic theory of gases 3=14207
 Laplace operator, physical meaning 3=21192
 launching tube for projectile motion expts 3=3777
 liquids, magnetic susceptibilities, Quincke method 3=17016
 Lorentz transformation in undergraduate curriculum 3=14004
 magnetic field measurement, low, by e.s.r. 3=5807
 Maxwell's eqns., text-book derivations 3=471
 measurement of Fermi energy by positron annihilation 3=25263
 Mercury reservoir, demonstration of gas props. 3=151
 Mössbauer effect, resource letter 3=6143
 Oersted medalist, 1962 3=21182-3
 "open-ended" expts. for physics majors 3=23725
 optical image formation, Abbe theory 3=24009
 optical phenomena, photographic demonstration 3=257
 p-n junction detector, use 3=4298
 photon and electron high-energy physics, review lecture 3=14932
 physics building for Univ. of California 3=13993
 physics course for students in humanities 3=4
 physics curriculum for schools, 3=11652
 physics in a toy boat 3=9638
 power supply and amplifier for student lab. 3=346
 projectiles, components of motion 3=14083
 quantum and statistical aspects of light, resource letter 3=11877
 quantum-mechanical scatt. theory 3=3755
 satellite orbit dynamics, guide to literature 3=11610
 school auditorium, acoustics 3=14299
 school classrooms, acoustic problems 3=14298
 school music departments, acoustics 3=14300
 school sound installations 3=13994
 schools, acoustic problems 3=14296
 schools, acoustic problems, effect of changes 3=14297
 spark chamber, for cosmic-ray demonstrations 3=22221
 special relativity, force transformation laws 3=21217
 special relativity, geometrical introdn. 3=34
 stroboscopic tachometer, uses 3=3905
 thermal diffusion in rod 3=11964
 transition from student to research apprentice 3=23726
 2-dimensional motion demonstration 3=9383
 Ukrainian higher educational institutions, physics research 3=18686
 undergraduate curricula for physics majors 3=11656
 undergraduate research projects 3=3702
 vertical ballistic pendulum apparatus 3=23819
 X-ray diffraction, reciprocal lattice concept 3=5095
- demonstrations**
 amplification, travelling wave, mechanical analogue 3=21191
 angular momentum conservation 3=5398
 beats, interference pattern 3=23985
 billiard-ball collisions 3=11654
 binding forces, demonstration model, using potential superposition 3=25036
 Brewster's angle determination apparatus 3=11942
 centre-of-mass, photographs 3=11739
 crystal structure, module building blocks 3=11653
 diffraction, Fresnel, using 3 cm e.m. waves 3=18687

Teaching — contd**demonstrations — contd**

- diffusion, H_2O , in air, meas. 3=21425
- electromagnetic fields, effects 3=5813
- electroscope, large, demonstration 3=12062
- Fourier transform zeros, rectangular pulse 3=9320
- impact, with plastic croquet balls 3=95
- interference, two slit sources, using 3 cm e.m. waves 3=18687
- light vel. meas. by μ_0 , ϵ_0 det. 3=5508
- Lorentz transformation, illustration 3=23748
- magnetic resonance model 3=14736
- magnetism, inverse-square law 3=5803
- Michelson and Jamin interferometers, suitability 3=19013
- moment-of-inertia apparatus, slow-motion 3=21282
- n.m.r. expts. on liquids and solids 3=25583
- nuclear chain reactions, mousetrap model 3=5316
- nuclear magnetic resonance, Co^{59} , by grid dip meter 3=6766
- particle mechanics, using simple spring gun 3=5399
- polarized light, refraction and reflection, experiments 3=19029
- shock waves 3=9546
- special relativity, vel. transformation, geometrical demonstration 3=23747
- time switch for corridor demonstration 3=7083
- velocity meas., stroboscopic, bullet 3=21286
- viscosity, mean free path, air, meas. 3=21425
- K atoms in A, m.f.p. det. 3=6367

Technetium

- melting point, and periodicity for transition metals 3=7386
- superconducting transition temperature 3=334

Technetium compounds

- Tc—Al phase diagram 3=20882
- TcAl₃, unit cell meas. 3=5115
- Tc₂(CO)₁₀ crystals, unit cell and space group 3=3299
- TcO₄⁻, diffusion coeff., by conductivity, N/10 soln., 25°C 3=16609

Telescopes

- anamorphic, four-lens, thin lens aberr. 3=7309
- anamorphic, four-lens, thin lens design 3=21529
- geodetic, effect of achromatism 3=14328
- radio transit, steerable in azimuth 3=9260
- resolving power, rel. to 2 point sources of differing intensity 3=3873

astronomical

See also Radioastronomy.

- balloon borne, Stratoscope II for planetary observation 3=16350
- design, Schmidt camera, Baker type, and Cassegrain, glass 3=11487
- for extragalactic surveys, design 3=7042-3
- γ -ray telescope, high energy 3=21146
- Kitt Peak, auxiliary optical systems 3=9143
- large, limitations due to atmosph. turbulence 3=7012
- polarization meas. 3=7019
- polarization meas., errors, 4-parameter effects 3=7015
- reflector, astrometric, 152 cm 3=7009
- refracting objectives design, review 3=9141
- solar, design and construction 3=7016

Tellurium

- atomic structure, 3=12755
- diffusion and elec. migration of Tl, meas. 3=17791
- diffusion and solubility in Ge 3=2825
- effective mass of hole carriers, from thermoelec. data 3=23028
- electrical conductivity, anisotropy investig. 3=17820
- electrical props. after purification 3=17898
- electron lifetime and surface recombination velocity 3=877
- galvanomagnetic coeffs. at 4.2°K 3=835
- liquid, density, up to 750°C 3=9436
- liquid, elec. cond. and Hall effect, up to 850°C 3=9474
- liquid, optical props. and elec. cond. 3=14168
- liquid, semiconducting solns with Se 3=3813
- magnetic susceptibility, temp. var. 3=18063
- magnetoelectric properties, valence band, structure 3=22953
- melting curve up to 23 000 kg/cm² 3=19066
- molten, elec. resist. and Hall effect 3=9475

Tellurium — contd

- optical properties and band structure 3=13151
- paramag. reson., 1.5-60°K 3=13308
- piezoelectric crystals, reflection light, harmonic prod. obs. 3=18956
- production and analysis to high purity 3=18684
- resistivity rel. to pressure up to 3×10^5 kgm cm⁻² 3=2902
- specific heat at low temp. 3=8362
- spectrochemical analysis, impurity effects, arcs. 3=25847
- spectrum, f-values 3=17534
- spin-spin coupling with protons 3=719
- thermal conductivity 80-650°K 3=6483
- thermoelectric properties, effective mass of hole carriers 3=23028
- thin film, absorption and reflectivity, u.v. 3=2995
- valence band structure, from magnetoelec. data 3=22953

Tellurium compounds

- halides, mol. structure 3=4759
- Te(50-80%)—Ga, phase diagram 3=11277
- TeF₆, Raman intensities for $\nu_1(a_1)$ modes 3=22559
- Te—Ga, metastable amorphous phases 3=20877
- Te—Ge amorphous alloy, dendritic crystallization 3=1266
- Te—Ge, metastable amorphous phases 3=20877
- Te—In, metastable amorphous phases 3=20877
- TeO₂, high-temp. heat content 3=770

Temperature

See also High temperature production and effects.

- Carathéodory's thermodynamics 3=9664
- composite rectangle, steady temp. eval. 3=11963
- crystals isolated at low temp., oscillations with mag. field 3=2743
- "electron" and "vibrational" temps., in l.p. N₂ discharges 3=9763
- Lorentz transformation 3=24070
- metals, surface, laser heated 3=24333
- negative, attainment by heating and cooling system 3=23782
- negative, prod. at p—n junction of degenerate semiconds. 3=4928
- programme control device 3=5552
- semiconductors, surface, laser heated 3=24333
- sparks, electric, peak, 4500-3000 A 3=4053
- stars, by electric discharge theory 3=16405-6

Temperature distribution

- breakdown, dielectric, time var., a.c. field 3=25407
- between centre and surface of Ni cylinder cooled by tempering 3=9641
- circle sector, composite, steady field 3=24086
- in cooled electrode of an arc heater 3=24087
- elastic rod, thin, semi-infinite, when free end is subjected to instantaneous temp. rise or transient temp. distrib. 3=14082
- fins, triangular 3=3908
- flat wall, elec. heated, linear temp. var. of thermal and elec. cond. 3=21596
- gas, jet, in arc electric, equilb., meas., spectra 3=21754
- meas., in microstructures, by i.r. 3=14400
- meas., thermister probe, fast response, for microstructures, at sea, 3=14402
- needle, sewing, during operation, by i.r. pyrometry 3=14403
- rectangular plates, radiation cooled, constant edge temp. 3=19049
- in rod, fluctuating temp. applied, teaching expt. 3=11964
- rotating sphere in fluid flow, thermal boundary layer 3=11766
- round plates, radiation cooled, constant edge temp. 3=19049
- solids, isotropic, homog., and semi-inf. 3=19040
- space vehicle, rotating, solar heating 3=7056
- stellar atmospheres 3=13904-5
- Venus, brightness temp. map 3=16360

Temperature measurement

See also Pyrometers; Thermocouples; Thermometers.

- arcs, using shock waves and spectroscopy 3=19225
- between centre and surface of Ni cylinder cooled by tempering 3=9641
- in borehole, lightweight equipment 3=21023
- by chemical indicators 3=9640
- chemical relaxations, temp. jump apparatus 3=5158

Temperature measurement — contd

- deviations of 10^{-3} to 10^{-6} deg C 3=11986
- in electric arc 3=16920
- electron microscope, specimen temp. inside, -150° to 2200°C 3=25787
- flame—high-freq-torch combination 3=3913
- flame spectral sources, from alkali indicator partial pressure 3=19051
- interferometric (Fabry—Perot), P I G reflex pulse discharge 3=24229
- international scale, role of Pt resist. thermometer 3=21598
- from luminescence, (Zn: Cd)S: Ag, (75:25) 3=8622
- new scales 3=9315
- nuclear quadrupole reson., appl. 3=14401
- photodiode as probe, sensitive to ± 0.005 deg F 3=24088
- plasma, in theta pinch, electron temp. meas. 3=12142
- plasmas, spectroscopic 3=9806
- plate, two-layer, fields, non-stationary, calc. 3=16828
- probe for flowing polymer melts 3=19052
- pyrometry, optical, numerical eval. 3=3914
- radiators, thermal, outer surface meas. 3=11998
- by radio telemetering, of mag. suspended rotors 3=7374
- by shock waves, arcs, C 3=19225
- standard, high intensity, pulsed Xe source 3=24000
- standard ice point, thermoelectrically maintained for thermocouples 3=19050
- surface of textile fabrics under intense thermal irradi. 3=11982
- surface, with thermocouples; attachment and radiation effects 3=281
- temperature diffs. in metals, using Hall generator 3=14404
- thermister probe, fast response, for microstructures, at sea 3=14402
- thermocouple, multipoint reference junction 3=7375
- thermodynamic and international practical scales 3=11981
- tubes, wall temp., thermocouple device 3=11983
- units and scales 3=21599
- of vacuum C arc, mag. confined 3=19930
- wall, surface, error, in thermocouple wire loss 3=16827
- C arcs, using shock waves and spectroscopy 3=19225
- Cu, strongly shocked, residual temp. 3=21597

spectral methods

- alkaline metal resonance lines 3=16829
- arc plasma flame jet, in terms of Fe spectrum 3=16921
- arcs, and by shock waves 3=19225
- arcs in liq. hydrocarbons, rel. to acetylene formation 3=7484
- plasma, argon 3=7502
- plasma jets 3=4151
- plasma, optically thin 3=7577
- shock tubes, OH⁺ TI band system, calc. 3=7281
- Hg lines, self-reversal, in arc tubes 3=21595
- use of NO γ_{an} band 3=10516

Tensors

- antisymmetric, canonical form 3=3947
- boundary-perturbation method for tensor fields 3=7087
- calculus and relativity, book 3=31
- calculus, book 3=5318
- conformal tensor calculus, review 3=5317
- Einstein's four-tensor 3=21223
- elastic tensor of given symmetry nearest an anisotropic elastic tensor 3=23812
- field dependent, symmetry restrictions 3=11
- magnetic, symmetry, 4 kinds, and anisotropy energy 3=13223
- module of holomorphic tensor fields 3=22053
- moving coordinate system, density, local derivative 3=23728
- Schwarzschild metric, empty-space generalization 3=18716

Terbium

- ferro and antiferromag. props. 3=15742
- films, resistance, spin-ordering effects 3=15547
- magnetic and elec. props., 1.4° -500° K 3=18113
- magnetic structure detm. by neutron diffraction 3=1108
- magnetoelastic properties 3=11091
- magnetostriction in flds. up to 15000 Oe 3=8680
- mag. susceptibility, 300°-1500° K 3=11033
- specific heat, 0.37-4.2° K 3=771
- Tb³⁺, energy levels in LaCl₃ 3=15689
- Tb³⁺ in soln., near i.r. transitions 3=23885
- Tb³⁺ tungstates and molybdates, luminesc. 3=10987

Terbium compounds

- 0.9TbCl₃. 0.1XCl₃. 6H₂O, X=rare earth ion luminescence lifetime 3=8620
- Tb hexa-antipyrene tri-iodide, fluorescent lifetime of Tb 3=13205
- Tb hexa-antipyrene tri-iodide, paramag. susceptibility 3=1125
- TbAl₃, mag. moment and Curie pt. 3=991
- TbCl₃, neutron diffract. & paramag. scatt. analyses 3=1328
- Tb₂C₃, neutron diffract. and paramag. scatt. analyses 3=1328
- TbD₃, magnetic structure 3=15911
- TbF₃, growth of highly-perfect single crystals for masers 3=23397
- TbFe garnet, magnetoelastic coupling 3=11043
- TbFe garnet, magnetoelastic coupling constants 3=15886
- TbIr₃, mag. structure, by neutron diffr. 3=23185
- Tb—Lu, elec. cond. and mag. phenomena 3=13033
- TbMn₂, antiferromagnetic props. 3=15910
- Tb₂O₃, neutron scatt., energy distrib. 3=743
- Tb—Y alloys, antiferromag. props. 3=15742

Terrestrial electricity

See Earth, electricity.

Terrestrial heat

See Earth, heat.

Terrestrial magnetism

See Earth, magnetic field; Magnetic storms.

Thallium

- atom, L-shell fluorescence meas. 3=4711
- atom, μ -mesonic, X-ray transition energies 3=6370
- Auger effect, K-LL calc. 3=8198
- diffusion and elec. migration in Te, meas. 3=17791
- diffusion in Cu, 785°-996°C 3=22826
- elastic constants and compressibility of hexag. single crystals 3=11134
- Fermi surface, by magnetoacoustic meas. 3=20132
- Fermi surface, open cross-sections 3=17687
- films superconductivity and normal cond. rel. to adsorbed O 3=16872
- fusion curve and polymorphic transition 3=6814
- ions, diffusion in fused TlCl, temp. depend. 3=5433
- light source colour temperature measurement 3=9587
- liquid, Hall effect, meas. 3=7218
- magneto-acoustic oscill., and Fermi surface, erratum 3=10629
- magnetoresistance and Fermi surface topology 3=17826
- spin-orbit coupling in electron band structure 3=10626
- spin-spin coupling with protons 3=719
- superconducting, effect of lattice defects 3=12036
- superconducting transition temp., press. depend. 3=21668
- Se, diffusion in, optical obs. 3=15512
- Tl⁺, diffusion in KBr meas. 3=6536
- Tl²⁰⁵ atomic beam frequency standard 3=13990

Thallium compounds

- salt solutions, with alkali halides, luminescence 3=5446
- Sb₂Se₃ saturated vapour press. and heat of sublimation 3=24116
- Tl amalgams, interdiffusion meas. 3=21332
- Tl azide, crystal particle size changes and lattice expansion on X-irradiation 3=22873
- Tl halides, evap. films, polymorphy 3=11261
- Tl halides, h.f. paramagnetism, theory 3=20560
- TlAsSe₂, glassy, photocond. and other props., effect of I and Ge 3=15635
- TlBiSe₃, films, hexagonal structure 3=20850
- TlCl, absorpt. and reflectivity spectra 3=3023
- TlCl, fused, refractive index rel. to temperature 3=11796
- TlCl, low temp. photocond. -3=10891
- TlCl, luminescence rel. to defects, dislocations and plastic deformation 3=952
- TlCl single crystals, preparation and luminescence 3=20799
- TlH, band spectrum, 4200-4300 Å 3=8270
- TlI, crystal structure, rel. to similar types 3=18338
- TlI₃, unit cell dimensions and isomorphism with NH₄I₃ and CsI₃ 3=11263
- TlNO₃, fused, transport numbers 3=16172
- TlNO₃, thermal phase transformations 3=1253
- TlNO₃, transition I \leftrightarrow II, energy and temp. 3=11197
- TlSe, saturated vapour press. and heat of sublimation 3=24116

Thallium compounds — contd

- Tl₂Se + As₂Te₃ systems with Sb₂Te₃, Bi₂Te₃, Sb₂Se₃, thermoelec. 3=10893
 Tl₂Se, component diffusion, rel. to rectification 3=25293
 Tl₂Se, saturated vapour press. and heat of sublimation 3=24116
 Tl₂Se, saturated vapour press. and heat of sublimation 3=24116
 Tl₂SO₄-H₂O system, sedimentation meas. 3=5172
 Tl₂Te₃-Bi₂Tl₃, phase diagram and properties 3=18343

Thermal conductivity

See Conductivity, thermal.

Thermal diffusion

See Diffusion in gases, thermal; Diffusion in liquids, thermal.

Thermal expansion

- alkali halides, calc. 3=17627
 alkali metal halides, and temp. derivatives 3=13389
 alkaline earth hexaborides 3=20113
 Bravais crystal, phonon frequ. shifts 3=2717
 ceramics, insulators, electrical, fracture, shock resistance 3=17675
 crystals, insulators, electrical, fracture, shock resistance 3=17675
 crystals, Pippard's relns. deriv. 3=8357
 diamond, anomalous negative low-temp. values 3=10603
 dilatometer, automatic recording 3=9639
 dilatometer, quartz, for 20-1000°C range 3=4825
 dilatometer, silica, for wide range of temps 3=7163
 dilatometers, Leitz, Bollenrath type, calibration 3=14398
 EI-437A alloy, 20-500°C, solid soln. and precipit. phase 3=2735
 f.c.c. and two-dim. square lattices, theory 3=25204
 glasses, soda silicate 3=22668
 graphite, accommodation 3=8371
 graphite, deformation by thermal cycling 3=23308
 graphite, pyrolytic, in a and c directions 3=774
 graphite, rel. to temp. and neutron-irradiation 3=2737
 Grüneisen const., free volume theory 3=25203
 magnetothermomechanics, theory 3=5012
 meas., optical method 3=11147
 measurement, above 2000°C, in vacuo 3=20693
 near melting point, anomalies in liquid and solid phase 3=21324
 metallic crystals, cubic symmetry 3=20112
 metals, Grüneisen's const., low temp. var. 3=15446
 naphthalene, solid and liquid, with soluble impurities, near m.p. 3=21324
 from Raman freq. shift, temp. var., crystals 3=10922
 rare earth hexaborides 3=20113
 semiconductors, effect of impurities 3=17664
 solids, linear chain model, close-packed atoms 3=17665
 solids, relationship with elastic constants 3=11130
 solids, textured polycrystalline 3=2736
 III-V cpds. 3=2914
 triglycine sulphate, rel. to temp., effect of X-rays 3=6481
 Ag, Grüneisen γ , temp. depend. calc. 3=10607
 Ag, Grüneisen ratio rel. to volume, calc. 3=4828
 Ag, 20°-1200°K 3=17663
 AgCl, rel. to Frenkel defects 3=10604
 Al, Grüneisen γ , temp. depend. calc. 3=10607
 Ar, solid 3=11147
 Ar, solid, linear chain model 3=17665
 Au, Grüneisen γ , temp. depend. calc. 3=10607
 Au, to 878°C, X-ray meas. 3=10605
 Au, 20°-1200°K 3=17663
 BaTiO₃, anisotropy 3=12929
 Be, temp. depend. 3=3297
 CdSb, anisotropy of linear expansion 3=25649
 CdTe, anomalous negative low-temp. values 3=10603
 Ce, giant coeffs., 1.5°-14°K 3=15442
 CeO₂, X-ray diffr. meas. 3=8370
 Co[Hg(SeCN)₄] 3=18083
 Cr, anomaly at Néel temp. 3=8753
 Cr ferrite, alloyed with various metals, temp. depend. 3=20900
 Cr, temp. depend. of coeff. 3=5100
 CsBr, calc., Grüneisen approx., by sums in wave-vector space 3=20115

Thermal expansion — contd

- CsCl structure, Grüneisen parameters rel. to temp. 3=4826
 CsI, quantum-mech. box model 3=4796
 Cu, Grüneisen γ , temp. depend. calc. 3=10607
 Cu, 20°-1200°K 3=17663
 D₂O¹⁸, liquid, up to ~80°C 3=14144
 Dy, contraction and magnetostriction, large 3=20551
 Dy, lattice parameters rel. to mag. ordering 3=15444
 Fe-Ni, f.c.c., two structures, "invar" effect 3=20114
 Fe-Pd alloys, γ -phase, Invar behaviour at 30 at.% 3=998
 Fe-Pd alloys with low exp. coeffs. 3=2734
 Fe-Si alloys, up to 1200°C, rel. to Si content 3=10602
 Fe₂O₃, α -phase, rel. to mag. transitions 3=5029
 GaAs, anomalous negative low-temp. values 3=10603
 Gd, anomalous expansion of single crystals 3=15851
 Gd, giant coeffs., 1.5°-14°K 3=15442
 Gd, lattice parameters rel. to mag. ordering 3=15444
 Gd single crystals, anomalous 3=11092
 Gd single crystals, anomalous expn. 3=6715
 Ge, anomalous negative low-temp. values 3=10603
 Ge, Grüneisen γ , temp. depend. calc. 3=10607
 Ge, 2 - > 42°K 3=15443
 He³, liq., 0.015°-0.3°K meas. 3=12016
 He³, liquid, at <0.1°K 3=5564
 He³, liquid, meas. 3=5563
 Hg amalgams, rel. to composition 3=16604
 Ho, lattice parameters rel. to mag. ordering 3=15444
 H₂O¹⁸, liquid, up to 80°C 3=14144
 In oxide 3=20111
 InSb, anomalous negative low-temp. values 3=10603
 KBr, calc., Grüneisen approx., by sums in wave-vector space 3=20115
 KCl, calc., Grüneisen approx., by sums in wave-vector space 3=20115
 KCl, Grüneisen γ , temp. depend. calc. 3=10607
 K₂NbO₃F 3=3306
 La, giant coeffs., 1.5°-14°K 3=15442
 LiF, quantum-mech. box model 3=4796
 MnAs, lattice coefft. 3=13226
 NaCl, calc., Grüneisen approx., by sums in wave-vector space 3=20115
 NaCl, Grüneisen constant at high pressures 3=4827
 NaCl, Grüneisen γ , temp. depend. calc. 3=10607
 NaCl, quantum-mech. box model 3=4796
 Nb₂Sn, jump at supercond. transition 3=16875
 Nd, giant coeffs., 1.5°-14°K 3=15442
 NH₄H₂PO₄ (ADP), 24°-134°C, X-ray det. 3=25202
 Ni, demonstration apparatus 3=4825
 Ni lattice, isotopic effect, temp. dependence 3=6482
 Ni, 20-500°C 3=2735
 Np, rel. to structure 3=10606
 Pb(Ti,Zr)O₃, anisotropy 3=12929
 PuC, 42-60 at.% C 3=10431
 Si, anomalous negative low-temp. values 3=10603
 Si, Grüneisen γ , temp. depend. calc. 3=10607
 Si, negative, below 120°K 3=773
 Si, 23°-530°C, X-ray meas. 3=4824
 α -Sn, anomalous negative low-temp. values 3=10603
 Sr₂FeTaO₆, increase at phase transform. at 250°C 3=18226
 δ -Pu, negative exp., effect of alloying 3=22669
 U, anomalous below ~43°K, and conductivity, electrical 3=20270
 U, α -phase, crystal structure near 43°K 3=6841
 U, rel. to structure 3=10606
 UC, 20°-1500°C 3=7079
 U₂O₃, up to 1026°, X-ray diffrn. study 3=15445
 W, 24°-526°C 3=15441
 Xe, solid 3=8480
 Yb, giant coeffs., 1.5°-14°K 3=15442
 ZnSe, anomalous negative low-temp. values 3=10603

Thermal measurement

See also Calorimeters; Calorimetry; Conductivity, thermal, measurement; Temperature measurement; Vapour pressure measurement. Entries describing measurement methods for specific thermal quantities and effects may also be found listed under the various headings for the subjects concerned.
 spectroscopy, dynamic refl., technique 3=18777

Thermal measurement — contd

- heat flow, using flux meters of various shapes, accuracy 3=9635
- BaTiO₃, grain size, effect on tetragonal to cubic transform. 3=8792

Thermal transformations

- See also Boiling; Heat of transformation; Melting; anils, thermochromy, time constants 3=20979
- balance, thermo, Stanton, modifications, to record wt. change and rate of change against temp. 3=9398
- chloroform, rel. to Raman spectrum 3=731
- decomposition, along dislocations, kinetics 3=8958
- formic acid, rel. to Raman spectrum 3=731
- high-temp. microscopy 3=18683
- methyl alcohol, rel. to Raman spectrum 3=731
- microscope for obs., high-temp. 3=18972
- polymers, fracture as thermal decomposition 3=18211
- BN, turbostratic to ordered-layer-lattice 3=11201
- B₂O₃, vaporization, mass-spectrometric study 3=25807
- CD₄ 3=22658
- CH₄ 3=22658
- He, solidification, observation 3=324
- HNO₃ ↔ NO + NO₂ + H₂O, vapour-phase equilibrium 3=25813
- LiBO₂, vaporization, mass-spectrometric study 3=25807
- NaBO₂, vaporization, mass-spectrometric study 3=25807
- S vapour, equilibrium composition 3=25805

Thermionic emission

- See also Ionization, surface.
- conversion of heat into elec. energy 3=9713
- diode containing Kr⁸⁵, characteristics rel. to Rb⁸⁵ daughter effects 3=24335
- direct converter, effect of space charge 3=9718
- dispenser cathode, impregnated, activ. process 3=4178
- metals, refractory, in Cs vapour, low coverage, discontinuity 3=14625
- HfC 1300°-1900°K 3=16974
- MoC, 1300°-1900°K 3=16974
- Na₂CO₃ 3=19306
- TaC 1300°-1900°K 3=16974
- Ta_{0.8}Zr_{0.2}C, 1300°-1900°K 3=16974
- ThC, in direct conversion of heat 3=4000
- TiC 1300°-1900°K 3=16974
- ZrC 1300°-1900°K 3=16974

electrons

- See also Cathodes.
- cathode, oxide-cored 3=9832
- from charged particles 3=9731
- by disperser cathodes, activated 3=12235
- by dust particles in a gas 3=14528
- energy distrib. of emitted beam, relax. 3=12247
- gas-solid suspension at high temp. 3=14527
- ionic crystals, work function calc. 3=12227
- laser induced, from conductors, semiconds., insulators 3=14626
- metals, laser induced 3=24333
- Schottky effect, periodic deviations, numerical analysis 3=424
- semiconductors, ionic, in strong fields 3=2982
- semiconductors, laser induced 3=24333
- shallow-donor emitters 3=422
- temperature of filament, general calc. 3=14629
- BaO, doped with rare earths 3=422
- C, induced by laser beam 3=19304
- Cs vapour diode 3=14628
- LiF: Co, X-irrad. and non-irrad. 3=8598
- Ni, Ba-coated, reversal phenomenon 3=21860
- Ni, Ba-coated, theory and expt. 3=21859
- Rh in Cs vapour, low coverage, discontinuity 3=14624-5
- SrO, doped with rare earths 3=422
- Ta, in Cs vapour, low coverage, discontinuity 3=14624-5
- TaB₆ 3=7631
- Th, filament temp. calc. 3=14629
- Th-W, maser, optical, induced 3=19305
- Th-W, saturated emission at high currents, meas. 3=19307
- UC cathode, collector electrode contamination 3=4179
- W, cathode, laser induced 3=21857
- W crystals, periodic Schottky deviations 3=21863
- W, in Cs vapour, low coverage, discontinuity 3=14624-5

Thermionic emission — contd**electrons — contd**

- W, induced by laser beam 3=19304
- Zr, filament temp. calc. 3=14629

ions

- See also Ion emission.
- electron space charge, compensation 3=9867
- ions, positive, metals, semiconductors, laser induced 3=24333
- laser induced, from conductors, semiconds., insulators 3=14626
- Fe oxide catalysts, with alkali metals, positive-ion emission, mass-spectrometric study 3=21891
- Ni, in various gas atmospheres 3=14663
- Pt, in various gas atmospheres 3=14663

Thermionic tubes

- See Electron tubes.

Thermochemistry

- See Heat of reaction, etc.

Thermocouples

- calibration to 2200°C, Ti-tube furnace 3=283
- cascade generators, optimal operation mode, efficiency 3=2985
- cooling, rapid, thermo-couple solders on quenching in water 3=7371
- differential sensing controlled 3=21600
- in HERO reactor, calibration by gas thermometer 3=284
- reference junction, multipoint, in temp. meas. 3=7375
- standard ice point, thermoelectrically maintained 3=19050
- thermal inertia, equations 3=11985
- thermopile + motor, thermal energy converted to motion 3=9717
- thermopile, ribbon, miniaturized version 3=290
- thermopiles, radiation, for precise photometric meas. 3=3862
- vacuum gauge, circuit diagram 3=5473
- in vacuum system, Mo and Kovar fused to glass 3=24092
- Ag thread-Co film, power, rel. to temperature 3=15539
- Bi-Sb junctions prod. and props. 3=15640
- Bi₂Te₃, efficiency in cascade elements 3=2985
- Cu-Pb, 77.4°-298°K 3=20425
- PbSe, efficiency in cascade elements 3=2985
- Pt-Pt/Rh, effect of thermal neutron irradi. 3=3915

Thermodynamic properties

- See also Critical constants, thermal; Entropy; Heat of reaction; Latent heat; Thermal transformations.
- air plasma, equilibrium calc. at high temps. 3=24275
- alkali halides, Debye temps., temp. depend. 3=22667
- alloys, molten, dilute, interaction parameters 3=16603
- antiferromagnets, mag. field depend. 3=3143
- benzene, adsorbed on graphite, calc. 3=18398
- chlorobenzene + bromobenzene mixtures 3=296
- corundum, enthalpy, 500-2000°C 3=20103
- crystals, anharmonic free energy at high temps. 3=25163
- at Curie point, const.-coupling calc. 3=20108
- 1, 2-difluorobenzene 3=8291
- enthalpy and flame stability 3=279
- enthalpy of gases, calorimetric probe 3=21605
- ferromagnetic, isotropic, with arbitrary spin, Green's functions 3=8648
- gas, ideal, obeying "intermediate" statistics 3=18741
- gases, and compressibility factors, derivative, two new 3=11826
- gases, harmonic oscill. vibr. contribs., tables 3=23926
- gases, imperfect, and liquids, theory 3=14208
- gases, real, theory, book 3=11816
- hard sphere mol. mixtures, Monte Carlo calc. 3=23925
- hydrogen, liquid, quantum effects 3=21319
- ketene 3=12854
- of metallic solid solns. 3=8885
- metals, by functional variational princs. 3=752
- metals, de Haas-van Alphen effect 3=8641
- metals, thermoelectricity with melting 3=25423
- methyl isothiocyanate, molal, ideal gas state, 273-1000°C 3=14210
- para-hydrogen, press-density-temp. (15-100°K, up to 350 atm) relations 3=14146
- polaron in uniform mag. field, free energy 3=2769
- polyatomic molecules, partition functions, centrifugal distortion corrections 3=22522

Thermodynamic properties — contd

- polymer solutions, polar 3=14158
 polymers, polar, in soln. 3=11790
 polypropylene, atactic and isotactic, rel. to structure 3=10597
 proton hydration enthalpy 3=21337
 Rochelle salt, ferroelec., electrocaloric effect 3=25403
 semiconductors, activity, and intrinsic ionization equilibrium 3=17836
 silicates, initial, from structure analogy 3=18269
 silyl halides, and potential constants 3=8280
 solutions of liquified-gases 3=14145
 thiolacetic acid, molal, ideal gas state, 273-1000°K 3=14210
 thiophosphoryl halides, calc. 3=2634
 thiourea, molal, ideal gas state, 273-1000°K 3=14210
 XYZ₂ molecules, calc. 3=2626
 XYZ, planar type of molecules 3=12797
 XY₂Z type of molecule 3=12798
 Ar-O, Ar-N, Ar-CO liq. systems 3=132
 Ag + Bi alloys, liquid, 1000°K, from vapour pressure 3=14422
 Ag-Cd alloys, α , β , γ and ϵ phases 3=13522
 Al-Ag, interaction energy 3=8886
 Al black, thermal props. 3=23369
 Al-Cu alloys, liquid, 1000°K, Cu activity 3=14152
 α Al₂O₃, enthalpy 3=25198
 Al-Zn, interaction energy 3=8886
 Ar plasma 3=21819
 Au-Ni, interaction energy 3=8886
 BeO, 298-1200°K, enthalpy 3=25196
 Bi₂Te₃, 370-410°K, ΔZ , ΔS , ΔH 3=22657
 BrF₃, calc. 3=2631
 CD₄, liquid and solid 3=22658
 CH₄, liquid and solid 3=22658
 CH₄-Ar system, ~90°K 3=14145
 CH₄-CO system, ~90°K 3=14145
 CO-N, CO-Arlig. systems 3=132
 Cd, alloying with Bi 3=23548
 CoSO₄·7H₂O, magnetothermodynamic data, 0-100 kG 3=25504
 Cs plasma, chemical potential, rel. to work function of electrode in plasma 3=21820
 Cu-K sulphate, spin system, thermodynamic properties 3=20109
 D₂, calc. from H₂ eqn. of state 3=23929
 D₂SO₄ molecules 3=12842
 Dy₂O₃, enthalpy and entropy meas. 3=20106
 Er₂O₃, enthalpy and entropy meas. 3=20106
 GaO, molecular, up to 3000°K 3=25093
 Gd₂O₃, entropy and enthalpy, 10°-350°K 3=20105
 GeTe 3=295
 H gas, monatomic, high temp. 3=18855
 H isotopes, including quantum effects 3=21321
 H₂ and D₂, -175°C to 150°C, up to 2500 atm 3=23930
 H₂, on cell model, Lennard-Jones-Devonshire, six isotopes 3=21318
 HNC 3=22584
 HNCO, and mols., Urey-Bradley force field 3=12799
 HNCS, and mols., Urey-Bradley force field 3=12799
 H₂S₂, molal, ideal gas state, 273-1000°K 3=14210
 H₂SO₄ molecules 3=12842
 He isotopes, including quantum effects 3=21321
 He II, liq., entropy prod. and heat flow 3=21641
 Hg-Sn, partial molar enthalpies 3=5116
 Hg₂O₃, enthalpy and entropy meas. 3=20106
 I₂-N₂⁻ complex 3=21377
 IF₃, calc. 3=2631
 IF₃, mol., from Raman spectrum 3=2630
 K₂CO₃, enthalpy changes up to 975°K 3=22663
 La₂O₃, entropy, enthalpy, and Gibb's function 3=20104
 Li₂CO₃, enthalpy changes up to 975°K 3=22663
 LiF-KF molten system, molar mixing enthalpies 3=21338
 MgO, 298-1200°K, enthalpy 3=25196
 Mo, enthalpy, 0-2400°K 3=20102
 N-Ar, N-O, N-CO liq. systems 3=132
 NO₂Cl molecule 3=12797
 NO₂F molecule 3=12797

Thermodynamic properties — contd

- NP₃, and mols., Urey-Bradley force field 3=12799
 Na vapour, calc., criticism 3=21444
 NaCl, enthalpy 3=25198
 Na₂CO₃, enthalpy changes up to 975°K 3=22663
 NaOH and monohydrate 3=7388
 Na₂TeO₄, high-temp. heat content 3=770
 Nd₂O₃, entropy, enthalpy and Gibb's function 3=20104
 Ni 99.95% pure, enthalpy, 1120°-1919°K 3=8359
 Ni-Zn alloys, α -f.c.c., at high and low temp 3=25746
 O-Ar, O-N, liq. systems 3=132
 PFC₂, calc. 3=2626
 PbBr₂, activity coeffs., in reciprocal molten salt systems
 PbBr₂ + NaCl and PbCl₂ + NaBr 3=16155
 Pd₂H, energy evolution below 1°K 3=8665
 SCl₂, molal, ideal gas state, 273-1000°K 3=14210
 S₂Cl₂, molal, ideal gas state, 273-1000°K 3=14210
 Sb₂Te₃, 380-420°K, ΔZ , ΔS , ΔH 3=22657
 Sc, high-temp. thermodynamic functions, estimation 3=24119
 SiD₃NCS, calc. between 100°-1200°K 3=22573
 SiF₄, from 15°K to triple point 3=21636
 SiHBr, molecule 3=12798
 SiHCl, molecule 3=12798
 SiH₂NCS, calc. between 100°-1200°K 3=22573
 Sm₂O₃, entropy and enthalpy, 10°-350°K 3=20105
 TeO₂, high-temp. heat content 3=770
 TiO₂, defect equil. and O vacancies 3=2786
 Tl, alloying with Bi, Sb, oxidation effects 3=23548
 VC 3=1386
 W, enthalpy, 350-2000°K 3=8361
 Yb₂O₃, entropy and enthalpy, 10°-350°K 3=20105
 YH₃ and YD₃, 15°-350°K 3=17658
 ZnS-CdS, Cu activated, reaction enthalpy 3=6678
- Thermodynamics**
 See also Atmosphere, thermodynamics; Entropy; Equations of state.
 adiabatic invariance and Boltzmann's system 3=9361
 adsorption—extension phenomena 3=20937
 Boyle's-law gas, internal energy, sp. hts. 3=11831
 Carnot cycles, teaching diagram 3=21639
 Carnot engine with thermally ionized gas as working fluid, energy obtainable 3=5558
 Carathéodory's treatment, simplification 3=24121
 circuits, Onsager-Casimir relns. 3=12039
 compression, limitation on modulus 3=21273
 conference, Onsager, Providence (1962) 3=7131
 correlated interacting subsystems 3=7138
 correlated systems 3=18740
 entropy concept and ordering of states 3=5559
 explanation on quantum mechanics basis 3=11715
 ferromagnet, Heisenberg, perturb. theory 3=11046
 first and second laws, independence 3=307
 flow, gas, magnetohydrodynamic, with radiation 3=19425
 force stream function discontinuities 3=16845
 free energy of system with random elements 3=23778
 functions, rel. to u.s. velocity and compressibility 3=7395
 gases, real, theory, book 3=11816
 gases, three-particle scatt. operator 3=11827
 H-theorem and Markov processes 3=11709
 irreversible, conference 3=9356
 irreversible, Meixner's theorem, invalidity 3=63
 irreversible processes, variation principle 3=16541
 irreversible, steady-state processes 3=64
 kinetics of small systems 3=8864
 low-temp. gas refrigeration, McMahon-Gifford system 3=16848
 martensite-ferrite transformation 3=5120-3
 maximum dissipation rel. to structure eqns. 3=308
 negative temperatures, by heating and cooling system 3=23782
 Nernst's theorem, deriv. of wave mechanics 3=47
 nonequilibrium, development 3=11711
 nonequilibrium, diagonalizing phenomenological matrices 3=23776
 plasma, local thermal equil., validity 3=19233
 quantum theory, basis 3=18739
 refrigeration by adiabatic demag. 3=14431
 relativistic 3=7094

Thermodynamics — contd

- second law, for negative and imaginary mass particles 3=7092
- solid solutions, interstitial, appl. of Green's functions 3=18362
- statistical, elements of, book 3=7134
- statistical, of nonuniform fluids 3=7135
- Stokes flow of sphere, soln. by minimization of energy dissipation 3=9424
- temperature and Carathéodory's postulates 3=9664
- transitions, kinetic 3=16845
- transport processes, range of validity 3=7151
- vapour—solid nucleation kinetics, theory 3=16843
- vaporization and condensation, theory 3=19070
- variational princ. and entropy prod. 3=23780
- zeroth law 3=60

applications

- adsorption, internal, in solids 3=1383
- adsorption of monatomic mols. on graphite 3=13572
- air, plasma, particle—radiation equil. 3=4118
- alloys, isoactivity diagrams for components 3=5118
- condensation, homogeneous nucleation 3=3931
- crystals, Pippard's relns. deriv. 3=8357
- diffusion, self, adsorbant medium, and kinetics 3=9376
- elastic deformation, irreversible processes 3=3207
- electrochemical adsorption reactions 3=5168
- electrolysis, Soret effect, heat of transport 3=13615
- electro-thermomag. generators, efficiency 3=9715
- ferromagnetic—paramag. Curie points diff. 3=1127
- gas props. behind shock waves 3=21493
- Ising spin system, relax. kinetics 3=989
- liquid binary mixtures, law of corresponding states 3=21344
- liquid → glass transformation 3=12003
- magnetohydrodynamic generators 3=4001
- magnetothermal devices, figure of merit 3=358
- masers, pumping power systems 3=14333
- mass-transfer potl. and chemical ptl. 3=24123
- metals, effect of shock waves 3=9547
- nuclear power station, optimum cycle, approx. 3=6321
- plasma, ion velocity distrib., relaxation 3=4111
- polymer solns., second osmotic virial coeffs. 3=3802
- radiating gas, irreversible energy exchange 3=14429
- real gases, collision lifetimes 3=9496
- semiconductors, electron chemical potential 3=2873
- steam—water globules interaction 3=297
- viscosity and plasticity theory 3=18766
- viscous gas flows with heat transfer 3=24122

Thermoelasticity

- axisymmetric, variational solution 3=18765
- compression, limitation on modulus 3=21273
- crack in elastic body, thermal stresses 3=9382
- dynamic, for conditions on circular cone 3=3774
- isentropic motion, displacement equations, finite isothermal initial strain 3=14081
- isentropic motion of a medium, finite deform. 3=18883
- magneto-, general two-dimensional problem 3=18762
- magneto-plane problem 3=23816
- stress distrib. inside earth 3=23563
- BaF₂ 3=18161
- Ba(NO₃)₂ 3=18161
- CaF₂ 3=18161
- Fe—Ni alloys, Invar type, variation rel. to mag. transformations 3=25607
- Mg(H₂O)₆(BrO₃)₂ 3=18161
- N₂H₄Cl₂ 3=18161
- Ni(NH₃)₆(NO₃)₂ 3=18161
- Pb(NO₃)₂ 3=18161
- Sr formate, simple dihydrate, u.s. meas. 3=23281
- Sr(NO₃)₂ 3=18161

Thermoelectricity

- See also Thermocouples.
- acids, strong, solutions, initial 3=14181
- alloys of transition elements in normal metals, low temp. anomalies 3=8496
- alloys, rel. to temp. and composition, theory 3=4957
- apparatus to meas. up to 1000°C for semiconductors 3=24159
- basic concepts in teaching 3=341
- binary alloys, short range order effects 3=8901
- calorelectric effect in flames 3=19184

Thermoelectricity — contd

- cathodes, oxide, and conductivities, BaO, SrO, (BaSr)O 3=17969
- characteristic power of boundary atoms 3=17968
- cooling element, use for thermal cond. meas. 3=19044
- cooling, material charac. and appl. 3=19167
- cooling, minority-carrier thermoelectric, theory 3=15638
- crystals, semiconductor, in magnetic field, calc. 3=6565
- crystals, tetragonal, ellipsoidal models 3=25317
- freeze-drying thermoelec. unit for biological tissues 3=11619
- fused ionic materials, theory 3=9477
- galvano-thermomagnetic energy conversion devices 3=9716
- galvanothermomagnetic energy converters, anisotropic materials 3=21695
- general expression, "average energy gain", method 3=20258
- generator, using close W or Th-W electrodes in vacuo 3=14512
- glass, irradi. by Co⁶⁰ source 3=2983
- graphite, pyrolytic, rel. to structure 3=826
- heat pump with surface heat transfer 3=8575
- ice, steady state theory 3=10899
- ionized fluid, theoretical analysis 3=24271
- mag. generators, efficiency 3=9715
- maximum figure of merit, simple eval. 3=20423
- metals, liquid 3=143
- metals, liquid (10 elements) 3=145
- metals, melting, thermodynamics 3=25423
- metals, power 3=20422
- oxide cathodes on nickel cores, thermoelec. power 3=25426
- Peltier-effect devices, dynamic response calc. 3=23030
- Peltier effect, for obs. of melting boundary motion on current heating 3=19064
- Peltier junctions, pulsed with high currents, temp. drop 3=15639
- plasma, low temp. 3=19277
- powder metallurgy of materials, sintering 3=3346
- power generators, efficiency calc. 3=14510
- refrigeration at low temp., theory 3=359
- refrigeration, suitable alloys, Bi₂Te₃—Sb₂Te₃ 3=913
- rutile, Al-doped, rel. to O₂ pressure 3=15596
- semiconductor, majority carrier sign determ., by hot-point probe 3=8498
- semiconductors, low mobility 3=25425
- semiconductors, phonon-drag Seebeck effect, longitudinal case 3=25424
- semiconductors, phonon-drag Seebeck effect in strong mag. fld. 3=25246
- semiconductors, polar, many-valley, variational calc. 3=2871
- semiconductors, power 3=2858
- semiconductors, sign, meas., liquid He temp. 3=16883
- semiconductors study 3=843
- semiconductors, two-band, figure of merit, bound 3=17967
- solid soln. alloys, correl. with elec. cond. 3=15534
- spinels, vanadium, rel. to interatomic distance 3=12934
- for standard temperature, ice point, for thermo-couples 3=19050
- steel, mild, rel. to plastic deformation 3=13141
- theory, from Boltzmann—Lorentz eqn. solution 3=10892
- thermo e.m.f. rel. to resistivity 3=23025
- thermostat operation to ± 0.006 deg C 3=285
- uniaxial crystals, figure of merit, orient. depend. 3=2981
- A₂B^{IV}X^{VI} compounds 3=2881
- AgNO₃, fused 3=9477
- AgSbTe₂, power, 80° to 300°K 3=13144
- AgSbTe₂—AgBiTe₃, —PbTe, and —SnTe 3=10900
- AgSbTe₂—Se_x, e.m.f. 3=875
- Ag₂Se, 80°–600°K 3=2926
- β—Ag₂Te, power meas., liq. N temp. to room temp. 3=837
- AgTiTe, power meas. 3=874
- Ag—Zn, β, β' and ζ-phases 3=8396
- As₂Te₃ + Ti₂Se systems with Sb₂Te₃, Bi₂Te₃, Sb₂Se₃ 3=10893

Thermoelectricity — contd

- Au alloys, thermoelec. power, effect of transition metals 3=13139
 AuAl₂, liq. He to room temp. meas. 3=10718
 AuGa₂, liq. He to room temp. meas. 3=10718
 AuIn₂, liq. He to room temp. meas. 3=10718
 AuSn, anisotropy and temp. depend. 3=17972
 BaO, (BaSr)O, cathodes, and conductivities 3=17969
 (Ba_xSr_{1-x})TiO₃, dielec. props. 3=2957
 Bi 3=10808
 Bi, at liq. He temps. 3=25354
 Bi, figure of merit 3=20424
 Bi, Kelvin reln. in mag. field, expt. 3=8573
 Bi, use for low-temp. refrigeration 3=359
 Bi-0.2 at. % Sn, power 3=25355
 Bi-Sb alloys, magneto-Seebeck effect 3=10896
 Bi-Sb alloys, rel. to magnetic field, 77°-295°K 3=10894
 Bi-Sb alloys, rel. to mag. fld. 78°-295°K 3=4958
 (Bi_{1-x}Sb_xTe_{1-y}) (TySe_{1-y}) 3=17869
 Bi₂Sb_{1-x}Te_{1+x}Se_x, non-stoichiometric 3=13138
 Bi₂Se₃, thermoelectromotive force, rel. to elastic strain 3=10832
 Bi₂Te_{2.7}Se_{0.3}, doped with Cu and Bi cpds. 3=10895
 Bi₂Te₃-Sb₂Te₃ with added Te and Se 3=913
 Bi₂Te_{3-x}Se_x, power, rel. to O content 3=860
 CaO films, power, rel. to temp. 3=20471
 Cd oxide pressed powders, with excess Cd or O, 77-400°K 3=22940
 CdGeAs₂ 3=8518
 CdSb, impurity effects 3=20325
 CdSb, pure and doped 3=17971
 CdSb, thermoelec. power, variation with temp. 3=2740
 CdSnAs₂ 3=8518
 CdSnAs₂, 100-600°K, and effective electron mass 3=17970
 CdSnAs₂-InAs solid solutions, 100-600°K, and effective electron mass 3=17970
 CoSi, -200°-+1200°C meas. 3=25427
 Cr, anomaly at 35°C 3=10897
 Cr, 4.2°-340°K, rel. to antiferromag. 3=13140
 CrB 3=1124
 CrN, Seebeck coeff. 3=865
 CrSi₂, -200°-+1200°C meas. 3=25427
 Cs, and alloys, low temps. mechanism 3=23027
 Cs-Sb layers, var. with Cs content 3=8574
 Cu, Peltier coeff. meas., phonon drag 3=20425
 Cu alloys, thermoelec. power, effect of transition metals 3=13139
 Cu₄Au, ordering meas. from thermoelec. data 3=25753
 Cu₄Au, thermo-e.m.f. calc. 3=4957
 CuFeS₂, power 3=1027
 Cu₂O, 500-1130°C 3=25428
 CuPt, thermo-e.m.f. calc. 3=4957
 Cu-Zn, α-phase, 4.2°-300°K 3=20267
 Cu-Zn-Sb alloys 3=23466
 Fe and Fe alloys, lattice binding forces invest. 3=2984
 FeB 3=1124
 FeNi₃, change due to mag., and magnetostriction 3=13262
 Ga, liq., abs. power, meas. 3=1710
 Ga, liq., up to 160°C at const. volume 3=23902
 GaAs, thermoelec. power and Nernst-Ettingshausen effect 3=10817
 GaSb, n-type, Seebeck effect 3=10819
 Ga₂Te₃ (59.5-60.0 at. %) Te, power meas. 3=10815
 Ge, bombarded by fast neutrons, meas. 3=10898
 Ge, magneto-Seebeck study in n-type, quantum transport 3=4914
 Ge, n-type, heavily alloyed, e.m.f. 3=15631
 Ge, rel. to hot current carriers 3=10791
 Ge, temp. and carrier density var. 3=20426
 GeTe, carrier compensation for various solutes 3=25365
 Hg, up to 160°C at const. volume 3=23902
 HgTe-CdTe, power, rel. to composition 3=17890
 HgTe-MnTe alloys 3=20335
 InAs, at low temps 3=8596
 InAs, 100-600°K, and effective electron mass 3=17970
 InAs-CdSnAs₂ alloys 3=2915
 In₂O₃, power, 180°-460°C 3=2918
 InSb, p-type, rel. to valence band and hole scatt. 3=22947
 InSb-Sb eutectic alloys 3=23401

Thermoelectricity — contd

- K, characteristic power of boundary atoms 3=17968
 KCl, fused 3=9477
 Mg₂Ge_xSi_{1-x}, 250°-600°K, meas. 3=13142
 α-Mn, mag. Brillouin zone effects 3=20555
 MnB 3=1124
 Mn-Si alloys, Seebeck effect 3=871
 NaCl containing CdCl₂ 3=13143
 NaCl, fused 3=9477
 NaCl, X-ray coloured 3=813
 Na-K alloys, liquid 3=145
 α-Nb₂O₅, nonstoichiometric composition 3=23026
 NiB 3=1124
 Ni-Cu alloys, power variation in magnetic fields 3=20427
 Ni-Zn ferrites, power 3=20336
 Ni_{1-x}Mn_{2+x}O₄, rel. to composition 3=13078
 PbBr₂, fused 3=9477
 PbCl₂, fused 3=9477
 PbS, pressure depend., up to 9000 kg cm⁻² 3=22948
 PbS, thermoelectromotive force, rel. to elastic strain 3=10832
 PbSe, thermoelectromotive force, rel. to elastic strain 3=10832
 PbSe-Bi₂Se₃ system, thermal e.m.f., rel. to composition 3=25742
 PbSe-Sb₂Se₃ system, thermal e.m.f. rel. to composition 3=25741
 PbTe, pressure depend., up to 9000 kg cm⁻² 3=22948
 PbTe, thermoelectromotive force, rel. to elastic strain 3=10832
 Rb, and alloys, low temps. mechanism 3=23027
 Rb-K alloys, liquid 3=145
 ReSi₂, thermal e.m.f. 3=872
 Sb₂Te, films, meas. 3=8514
 Se-Te solid solutions 3=22952
 Si, rel. to hot current carriers 3=10791
 Sn_{1-x}Se_x, max. figure of merit 3=20423
 SnTe, anomalous, rel. to band structure 3=17973
 SnTe, meas. rel. to stoichiometry 3=6604
 SrO, (BaSr)O, cathodes, and conductivities 3=17969
 SrTiO₃, dielec. props. 3=2957
 Te and Te-Se liquid solns. 3=3813
 Te, effective mass of hole carriers 3=23028
 TiO, power, 80°-400°K 3=17894
 Ti₂SeAs₂Te₃, vitreous 3=20418
 V, 4.2°-340°K, rel. to mag. transition 3=13140
 W_xTa_{1-x}Se₂, Seebeck coeff. 3=23029
 WO₃ 3=13083
 Zn, by He temps. meas. 3=8492
 ZnGeAs₂ 3=8518
 ε-Zn₃Sb₂, 20-470°C, discontinuities due to phase transformations 3=20346
 Zn₄Sb₃, rel. to semiconducting props. 3=15597
 β-Zn₄Sb₃, semiconducting temp. var. 3=22956
 ZnSnAs₂ 3=8518

Thermoluminescence

- alkali halides, after X-irrad., origin 3=3073
 alkali halides, by spectrophotometer, rapid scanning, automatic 3=18992
 apparatus 3=3871
 diamond, thermal rel. to optical activation 3=20547
 dosimetry of atomic bomb radiation 3=12611
 glass, heating apparatus for meas. 3=6685
 hyperbolic glow curves, apparatus 3=3917
 ice, rel. to stress and cryst. history 3=13649
 platinocyanides, and non-monomolecular processes 3=18030
 polyethylene, γ-irrad., effect of oxygen 3=4995
 polyethylene, γ-irrad., glow peaks meas. 3=4994
 polymers, γ-irrad., glow peaks meas. 3=4994
 quartz 3=11020
 ruby, γ-irradiated 3=23128
 spectrophotometer, rapid scanning, automatic 3=18992
 tyrosine, rel. to surface area and environmental gas press. 3=18052
 Al₂O₃, α-phase, after γ-irrad. 3=3072
 α-Al₂O₃, γ-irrad. high pressure effect 3=23129
 BaTiO₃, X-irrad. 3=968
 CaF₂:Mn, temp., Mn, Cl ions, var. 3=23127

Thermoluminescence — contd

- CaSO₄ —Mn, thermoluminescence rel.to exo-electron emission 3=2013
- CaSO₄ —Sm, exoemission rel. to thermoluminescence 3=2013
- I crystals, after X-irrad. at low temps. 3=6653
- In₂S₃, mechanism 3=20515
- KBr, effect of plastic deformation 3=23130
- KBr, strained, pure or Tl doped 3=18054
- KCl, F colour-centres, effect of impurities 3=20246
- KCl rel. to surface area and environmental gas press. 3=18052
- KCl strained, pure or Tl doped 3=18054
- KI strained, pure or Tl doped 3=18054
- LiF, effect of X-ray irrad. and heating 3=8479
- LiF, γ and neutron-irrad., impurity effects 3=11018
- LiF, for dosimetry 3=17116
- LiF radiation dosimeter 3=19511
- Mg, fluorogermanate, with and without Mn 3=18053
- NaCl, effect of X-ray irrad. and heating 3=8479
- NaCl, γ -irrad., effect of Ca doping 3=11017
- NaCl, rel. to surface area and environmental gas press. 3=18052
- NaCl with Cd, Na addns., X-ray coloured 3=813
- ZnO, characteristics, rel. to preparation 3=8633
- ZnS, glow curves, rel. to trapping levels 3=11019
- ZnS, rel. to impurities 3=20528
- ZnS:Cu, Al luminor, light sums rel. to electroluminescence 3=3074
- ZnS:Ga phosphors 3=23131

Thermomagnetic effects

See Magnetothermal effects.

Thermometers

- See also Pyrometers; Thermocouples.
- calibration, fixed point, review 3=24089
- gas, calibration of thermocouples used in HERO reactor 3=284
- mercury contact, constancy of contact temp. 3=7377
- mercury, as γ -ray calorimeter 3=7820
- quartz crystal, temp. deviations of 10^{-3} to 10^{-6} deg C 3=11986
- rain, thermistor 3=13656
- using saturated vap. pres. of two liquids 3=14405
- thermistor, digital display 3=24090
- thermistor, F-type 4=7376
- He⁴ vapour pressure bulb, errors 3=19082

resistance

- classification, Klemens and Lowenthal, criticism 3=5551
- dual-element type, with bridge circuit 3=282
- metal, effect of thermal neutron irrad. 3=3915
- oceanography, deep, Pt, short time const. 3=19053
- semiconductor, for low-temp. meas. 3=11984
- thermistor type, temp. change meas. 3=24091
- thin film, use as bolometer 3=3923
- In wire thermometers, mounting and performance 3=9645
- Pb-brass, for below 6°K 3=14430
- Pt, extension below 90.19°K, new interpolation method 3=17819
- Pt, role in international temp. scale 3=21598
- SiC, 4-10°K 3=9666

Thermonuclear reactions

See also Elements, origin; Nuclear fusion.

- bibliography 3=12098
- controlled, review 3=22442
- explosions at high altitude, rel. to radiation belt 3=9114
- Harwell work since 1958, review 3=7597
- high energy ion injection 3=15270
- nucleogenesis; exclusion principle and photobeta reactions 3=3529
- plasma, mass analysis of neutral flux 3=24996
- stars, heavy ions, up to Fe formation 3=9232
- toroidal discharge, Sceptre IV, review 3=7596
- C¹², prod. in stars, and γ -ray width of 9.63 MeV level 3=11568
- C¹² prodn. rate in the burning process 3=12581
- C¹³(p, γ)N¹⁴, and C¹³/C¹² ratio in stars, effect of possible N¹⁴ level ~ 7.60 MeV 3=11568
- Ne²⁰, prod. in stars, by O¹⁶(α , γ), γ -ray width of 7.20 MeV level 3=11568

Thermostats

See also Cryostats.

- controller, electronic, for linear or hyperbolic temp. rise 3=14407
- field precision, using mercury contact thermometers 3=7377
- image furnace radiant power control 3=9646
- liquid-He temp. regulator, to $\pm 10\mu$ deg 3=24128
- multi-metal, calc. 3=14406
- oil baths for standard-voltage cells 3=19055
- on-off switching time recording 3=16889
- Peltier refrigerator, control to ± 0.025 deg C 3=21601
- precision, with optically controlled thermometer and Peltier cooling 3=16830
- programme control device 3=5552
- regulator, down to 78°K, slow-neutron transmission expts. 3=12478
- temperature control for electron microscope 3=25787
- thermobimetallic strip, specific bending, formula revision 3=11987
- thermoelectric, to ± 0.006 deg C 3=285
- thermostat-stirring units, control improvement 3=19054

Thickness measurement

See also Particle size.

- Canada balsam films on water, interferometric meas. 3=9395
- coatings, by β -ray back-scattering gauge 3=23827
- collodion films on water, interferometric meas. 3=9395
- by convex lens and glass plate 3=16569
- films, activation method 3=23828
- films, by interferometer, reflectors, three layer, TiO₂, SiO 3=16793
- films, inhomogeneous, Vašiček procedure 3=1826
- films, optical meas., Vašiček procedure 3=1825
- films, optical method, non-destructive, 0.1-10 mils. 3=14087
- films, using interference microscope 3=11746
- films, using Tolansky's fringes 3=23826
- foils, thin bent, by electron micr. 3=13583
- iron foils, by electron microscopy, using domain structure 3=5400
- layer, by X-ray emission spectrum distortion, due to reabsorption 3=6898
- lubricant films, det. with scintillation counter 3=96
- optical lever gauge 3=14085
- portable gauge using γ -ray scatt. 3=14086
- by radioactive intensity, in Czechoslovakia 3=6874
- by radioactive isotopes, sensitivity and accuracy 3=9396
- semiconductor bicrystals, grain boundaries 3=2816
- solid films, mass-thickness meas., by electron scattering 3=21280
- thin film, silver-modified Newton's rings 3=9394
- thin films, to better than 1 Å by interference microscope 3=18772
- by X and γ -rays, ionometric methods 3=21279
- SiO₂ films on Si, optical meas. 3=13149

Thixotropy

No entries this year

Thorium

- alloying with Bi, Sb, thermodynamic properties, oxidation effects 3=23548
- atoms, Th⁹⁰, X-ray L-spectrum 3=8192
- in australites, by α -counting 3=7025
- deformation stacking faults 3=12990
- electron emission, filament temp. 3=14629
- foils, stacking faults energy 3=12991
- high-temp. props. of carbide-iodide Th 3=23378
- neutron absorpt., effective reson. integral 3=2544
- on Fe, thermal desorption 3=21856
- thoron escape from solids containing radiothorium 3=8475
- Th²³², Slater-modified Hartree-Fock calc. 3=12767

Thorium compounds

- nitrides and sulphides, review of phys. chem. props. 3=16473
- ThAl, crystal structure, rel. to similar types 3=18338
- Th₂Al, sorption of H₂, equil. pressure isotherms 3=20941
- Th₂Al—H and —D, neutron diff. and p.m.r. 3=20849
- Th₂Al—H system, crystal structure 3=20848
- Th₂Al₄H₈, order or disorder of H 3=20768
- ThC, in thermionic conversion of heat 3=4000

Thorium compounds — contd

- ThCo, crystal structure, rel. to similar types 3=18338
 Th—In phase diagram to 5.5 kbar 3=20886
 Th—Mo phase diagram 3=8896
 ThF₄, fused bath, electronic and ionic conductance, 1100° C 3=1394
 ThO₂, ads. of cations, anions, in dilute solns. 3=13608
 ThO₂, containing CaO, mechanical and dielectric relaxation 3=20700
 ThO₂, crystal structure, by neutron diffr. 3=20844
 ThO₂ polycrystals, elastic constants, effect of porosity 3=13331
 ThO₂, thermal atomic motions up to 1100° C 3=20845
 Th₂O, elastic consts., for varying porosity 3=23283
 Th oxalate, coprecipitation with Ca 3=1275
 Th₃(PO₄)₄, phosphors, luminescence 3=20523
 Th₃Pd₈, crystal structure 3=20878
 Th₃Pt₈, crystal structure 3=20878
 ThX (X = Pt, Rh, Co, Ru, Ir), crystal structure, atomic 3=11279
 Tl₂SeAs₂Te₃, vitreous, photoconductivity, thermoelectricity 3=20418
 Th—W, thermionic emission, maser, optical, induced 3=19305

Thulium

- arc spectrum, ionization potential 3=8193
 internal mag. field and elec. field gradient 3=8006
 isotopes, masses meas. 3=4727
 magnetic structure detm. by neutron diffraction 3=1108
 magnetization—temp. data 3=25507
 Tm³⁺, approx. excited eigenfunctions 3=2572
 Tm³⁺ in soln., near i.r. transitions 3=23885

Thulium compounds

- Fe garnet, Mössbauer effect Tm¹⁶⁹, 8.4 keV, nuclear h.f.s. 3=20061
 TmAl₂, mag. moment and Curie pt. 3=991
 Tm²⁺:CaF₂, maser, optical, continuous, 1.116 μ , low temp. 3=22016
 Tm₃Fe₂O₁₂, ferrimag. resonance 3=25557
 TmH_{2-x}, magnetization—temp. data 3=25507

Thunderstorms

- See also Lightning.
 rel. to atmospheric elec. cond. 3=9034
 and atmospheric electricity, pot. gradient, Poona, IGY 3=18514
 and atmospherics, integrated field, times 3=23597
 charge generation in clouds 3=11401
 currents, point-discharge, through living tree 3=9035
 data analysis, rel. to atmospherics 3=3470
 electrification, ice crystal charge by rebound from hail 3=6957
 electricity generation, review 3=1439
 growth and decay, rel. to atmospherics 3=3473
 and ionosphere, sporadic E 3=21059
 tropical, classification, and radar echoes 3=16214

Tides

- See Atmosphere, movements; Ionosphere;
 Oceanography.

Time interval measurement

- atomic time scale 3=11750
 frequencies, fixed or varying, accurate meas., to 10 Mc/s 3=16573
 frequency comparison precision by N¹⁴H₂, double-beam maser 3=12347
 frequency control symposium, Atlantic City (1962) 3=7172
 frequency standard, beam, choice of molecule 3=12882
 frequency standard, Cs beam, operation and improvements 3=13992
 frequency standard, primary, N¹³H₂, double-beam maser 3=12346
 frequency standard, Rb vapour, optically pumped 3=12991
 frequency standard, Tl²⁰⁵ atomic beam 3=13990
 frequency standard, using Cs beam resonators, direct and servo methods, comparison 3=11749
 frequency standards, use of solid-state masers 3=9989
 100 Mc/s digitron 3=9407
 nsec range, multichannel analysers 3=16574
 nsec region, using cathode-ray-tube E80T 3=9406
 nuclear lifetimes, sub- μ sec, survey 3=9706
 oscillograph time-base calibration 3=24171

Time interval measurement — contd

- photographic high-speed motion analysis 3=21291
 printing chronograph, tape control mechanism 3=1909
 scaling circuits, intervals and resolving times meas. 3=7175
 stroboscopic light source 3=18976
 sub-nsec lifetimes 3=19149
 superopticon, for time sweep of rapid events 3=24352
 10⁻¹⁰ μ sec, instrument 3=14094
 unit, astronomical definition 3=11651

Time measurement

- atomic clocks, resonance frequency shifts 3=10478-9
 atomic frequency standards, comparison 3=7173
 calc., summation of divergent series 3=11668
 Canadian radio time-signal system 3=14093
 ephemeris—universal time difference, from moon position meas. 3=21093
 quantum theory and "minimal time" 3=21242
 quartz clocks, regulation 3=7174
 standards, comparison between N.P.L. and L.S.R.H. 3=9318
 time-scale generator, logarithmic 3=9405
 unit, astronomical definition 3=11651

Tin

- acoustic wave atten. by conduction electrons 3=10593
 atomic mass of Sn^{116-120,122} and neutron separation energies 3=714
 coating on Cr-plated steel, bonding phase structure 3=5146
 coating on steel, bonding phase structure 3=5146
 in contact with In, Cd, Bi, melting 3=15525
 cracks, development in presence of Ga 3=20757
 creep, pressure depend. 3=23334
 crystallites on SiO films, size distribution 3=18380
 Debye—Waller factor, 0°-300° K 3=20083
 diffusion in Au crystals in boiling HCl 3=4888
 diffusion in GaAs, radioactive and elec meas. 3=22809
 diffusion in Ni surface 3=6539
 elec. resistance, 4.2°-1.65° K, rel. to sample size 3=2851
 elec. resistance, rel. to impurity 3=25324
 elec. resistance, 10°-14° K 3=2852
 electrical resistivity, 3.75°-4.22° K, and residual resistivity at 0° K 3=8491
 electron diffrn. examin., Kikuchi bands obs. 3=3293
 electron momentum meas., He temps. 3=6496
 Fermi surf. cross-section shape 3=8403
 Fermi surface from magnetoacoustic meas. 3=15469
 Fermi surface invest., by cyclotron res. 3=6493
 Fermi surface of white Sn, perturb. calc. 3=10624
 Fermi surface, size effect study 3=25241
 film normal—superconducting phase boundary, thermal propagation 3=16877
 films conductance during vacuum deposition 3=25327
 films, conductivity and supercond critical temp. rel. to electrostatic charging 3=15545
 films, dislocations 3=17736
 films, optical density meas. 3=20934
 films, supercond., vapour sources for vacuum deposition 3=9525
 films, superconducting, mag. moment 3=6687
 films, superconducting phase transitions, hysteresis 3=9687
 films superconductivity and normal cond. rel. to adsorbed O 3=16872
 films, superconductivity, rel. to residual gases 3=16878
 films, thin, on crystal substrates, condensed, orientation 3=13562
 films, thin, supercond., crit. current density rel. to temp. 3=3965
 gas flow through orifices, unrecognized characteristics 3=11814
 grey and white, interreln. 3=11209
 grey, dielec. const. det. from reflectance ratios 3=6640
 grey, electronic density distrib. and diamag. susceptibility 3=16069
 grey, lattice vibration spectrum 3=17642
 grey, valence band, i.c.b.o. method 3=779
 Hall effect, in strong mag. fields 3=15555
 isotopes, mass spectra 3=8215
 Kapitza resistance, 1.3-2° K 3=311
 lattice vibration spectrum of white Sn 3=8346
 liquid, Hall effect 3=144

Tin — contd

- liquid, nucleation catalysis in supercooled state 3=1270
- liquid self-diffusion in Sn plus Zn mixture 3=5432
- liquid, structure, X-ray determination 3=7197
- liquid, supercooled and superheated, structure 3=9440
- magnetoacoustic effects in longitud. fields 3=25192
- magnetoplasma resonance, l.f., meas. 3=8409
- magnetoresistance, dimensional and purity effects at low temp. 3=15554
- microhardness, effect of Na and Zn traces 3=3334
- overstressed microregions, mech. props. 3=11142
- phase transition, white—b.c.c. form 3=13452
- plastic deformation, initial 3=18181
- polycrystalline, grain boundary diffusion 3=2830
- polycrystalline, stress/strain diagram, position of jumps 3=3218
- powder, Mössbauer effect, doublet component asymmetry 3=20059
- powders, compacted, density 3=6875
- recrystallized surface, microhardness and structure, effect of Zn and Na impurities 3=20760
- semiconducting, Hall mobilities, n-type, grey, grown in Sn—Hg 3=17896
- shock compression up to 9×10^6 atm. 3=6786
- size effect, 1–5 Mc/s 3=842
- size effect, 1–5 Mc/s 3=8493
- spin—spin coupling with protons 3=719
- structure, effect of Na and Zn traces 3=3334
- superconducting, cylinder in mag. field, resistant/current var. 3=21658
- superconducting energy gap, by electron tunnelling 3=333
- superconducting films, mag. transitions 3=19124
- superconducting, microwave effects, nonlinear, and switching speed 3=19123
- superconducting transition temp., effect of nonmag. impurities 3=16876
- superconducting transition temp., effect of Sb impurities and plastic deform. 3=19125
- superconductive thermal boundary resistance, with Cu 3=19108
- superconductivity, destruction by current pulses 3=3966
- supercooled, nucleation catalysis, statistics to be used 3=21621-2
- surfaces features, crystallographic 3=18341
- surf. tension between superconducting and normal phases 3=5594
- temp. change at boundary with superfluid He 3=5570
- vacuum u.v. reflectivity, transmission and photoelectricity, 6–30 eV 3=13145
- whiskers, growth, rel. to heating, u.s. irradi., cooling, pressure 3=23414
- white, empty-lattice analysis of band structure 3=4836
- α -Sn thermal expansion, anomalous negative low-temp. values 3=10603
- β -Sn crystals, Mössbauer effect anisotropy, 77°–293°K 3=2700
- β -Sn lattice, $\text{Sn}^{119\text{m}}$ quadrupole interaction 3=17635
- β -Sn, resistive stress for twin thickening 3=25659
- β -Sn, slip- and twin dislocations 3=25658
- Sn—Pb supercond. mag. field detector 3=468
- Sn^{119} , n.m.r. in metallic tin 3=5052

Tin compounds

- organic, Sn^{119} 23.8 keV Mössbauer spectra 3=15415
- oxide, superconducting, tunneling, anomalous d.c. 3=14462
- tin bronze alloys, vacancy conc. rel. to plastic strain 3=23327
- Sn base cast alloys, elec. resist. rel. to composition 3=20262
- Sn—organic cpds, Mössbauer spectra anomalies rel. to chemical bonds 3=744
- Sn solutions, surface tension, temp. depend. 3=21340
- Sn sulphide, structr., films heated at 425°C 3=1327
- Sn sulphoselenide dislocation ribbons, geometry, surface influence 3=17734
- Sn—Ag, solidification, solute distrib. 3=16119
- SnBr_4 , Mössbauer effect 3=8340
- SnBr_4 , Raman spectra in crystalline state 3=15696
- SnBr_4 , Sn^{119} 23.8 keV Mössbauer spectra 3=15415
- SnCl_4 , crystal structure 3=5103
- SnCl_4 flame reactions, spectra, fluted bands 3=20990

Tin compounds — contd

- SnCl_4 , force consts. from vibr. data 3=6376
- SnCl_4 , Mössbauer effect 3=8340
- SnCl_4 , Raman spectra in crystalline state 3=15696
- SnCl_4 , Sn^{119} 23.8 keV Mössbauer spectra 3=15415
- Sn—Cu α solid soln., strain ageing 4=23346
- SnH_4 , proton mag. resonance 3=22602
- SnI_4 , far i.r. absorpt. 3=8604
- SnI_4 , metallic state 3=17812
- SnI_4 , Mössbauer effect 3=8340
- SnI_4 — S_8 , crystal structure 3=13475
- SnO_2 , effect of covalent binding on permittivity 3=17931
- SnO_2 , elec. and optical props. 3=2924
- SnO_2 , e.s.r. of Cr^{3+} , spin Hamiltonian 3=20645
- SnO_2 films, impurity-free, elec. props. 3=17897
- SnO_2 , γ -ray absorpt. spectrum, resonance, temp. depend. 3=22628
- SnO_2 , Mössbauer effect 3=8340
- SnO_2 /Cu preparation and crystal structure 3=8856
- SnO_2 /Na preparation and crystal structure 3=8856
- SnO_2 , n-type, films, refl. coeff., effect of free carriers 3=6642
- $\text{Sn}^{119}\text{O}_2$, splitting of Mössbauer line by u.s. vibrations 3=15426
- Sn—Pb alloys, 2-phase transition temperature 3=13540
- SnS_2 — Se_2S_3 , max. thermoelec. figure of merit 3=20423
- SnS_2 , dislocation ribbons, geometry, surface influence 3=17734
- SnSe, vapour pressure and heat of sublim. 3=21637
- SnTe, anomalous thermoelec. power 3=17973
- SnTe band structure, exptl. investig. 3=10841
- SnTe, elec. props. rel. to stoichiometry 3=6604
- SnTe, Hall coeff. and elec. cond., 4.2° to 295°K 3=10829
- SnTe, overlapping of valence and cond. bands 3=25233
- SnTe, vapour pressure and heat of sublim. 3=21637
- Sn—Te phase diagram near SnTe 3=6861
- Sn—Ti, grain boundary segreg. of Ti 3=16118
- Sn—Zn alloys, 2-phase transition temperature 3=13540

Titanium

- atom, μ -mesic, X-ray transition energies 3=6370
- cathode, fluorescence yield by X-ray photoeffect meas. 3=6663
- diffusion, in liquid cast Fe, by electrolysis 3=5431
- diffusion of metals, mechanisms 3=20233
- diffusion, self, thermal, high temps. 3=22828
- electrodeposition from aqueous solns. 3=16176
- electron emission, secondary, effect of absorbed gases 3=4183
- films, sputtered, elec. props. and structure 3=25328
- Hall effect, effect of preferred orientation 3=22906
- ions, Ti^{3+} , e.s.r. in glasses 3=3179
- ions, Ti^{3+} , in corundum, e.s.r., theory 3=23237
- i.r. properties, rel. to electron groups 3=17977
- μ^- -mesic atom, decay anomalies, search 3=2593
- ordering of α -phase containing O 3=6815
- oxidation, 500°C, electron microscope study 3=18434
- phase transformations, solid—solid, 0–90 kbar 3=20887
- photoelectric emission, by polarized X-rays 3=14630
- sample containers for radioactivity meas. 3=19905
- solubility in Be, X-ray diffrac. study 3=20908
- specific heat, 1.1°–4.5°K 3=15437
- specific heat, 600–1345°K 3=22660
- Sputtering by D ions, 10 to 25 keV 3=449
- α -Ti, thermal electron transitions, rel. to anomalous props. 3=20127

Titanium compounds

- complex ceramics, practical use as electrets 3=6622
- dielectric props. of non-stoichiometric rutile 3=2955
- oxides, X-ray spectra, emission bond type and $K\beta$, line changes 3=23092
- rutile, Cr^{3+} doped, maser, cross-relax 3=14798
- rutile, elec. props. rel. to O_2 pressure 3=15596
- rutile, far i.r. dielec. props. 3=15687
- rutile, point-defect relaxation 3=25265
- rutile (TiO_2) polarization and space-charge-limited current 3=895
- titanates, various, permittivity, variation with temp. 3=2953
- X-ray spectra, emission, bond type and $K\beta$, line changes 3=23092

Titanium compounds — contd

- Ti-Al alloys, three phases 3=13502
 Ti-Al, three phases meas. 3=13502
 Ti-Al-Co, ageing and mech. props. 3=18354
 Ti-Al-Co, mech. props., precipitation effects 3=18204
 Ti alloys, β - ω martensitic transformation 3=8892
 Ti-B-Al, Young's modulus and tensile strength 3=11132
 TiB₂, quadrupole bond, n.m.r. meas. and calc. 3=11121
 TiC, epitaxial growth of TiO₂ 3=5092
 TiC, thermionic emission, 1300°-1900°K 3=16974
 TiC-WC-Co, mech. props. and structure 3=18184
 TiC-WC-Co, structure, elec. and mech. props. 3=3316
 TiC-WC-(TaC), W diffusion 3=25295
 TiC₂, crystal structure 3=1321
 TiCl₃, crystal structure 3=16076
 TiCl₄-Ar mixtures, neutral Ti emission behind reflected shock waves 3=11836
 TiCl₄, Raman spectra in crystalline state 3=15696
 Ti ceramic, conductivity, electrical, var. during ageing 3=20380
 Ti-Cr alloy, hardness, effect of heat treatment 3=20879
 Ti-Cr alloys, elec. volume resistivity 3=22898
 Ti-Cr system, b.c.c., Kirkendall effect 3=4887
 Ti³⁺ hydrated salts, paramag. behaviour 3=6691
 Ti hydrides, Hall effect, 77°-300°K 3=13026
 TiFe₂-ZrFe₂ alloys, structure and mag. props. 3=20880
 Ti-(8%)Mn alloy, structural changes, rel. to wear 3=20890
 Ti-Mo alloy, martensitic phases 3=23477
 Ti-Mo, superconducting in high mag. fields 3=16879
 Ti-Mo, supercond. props., high-field 3=9686
 TiN, metallic bonding 3=8331
 TiN₄, absorption spectrum 3=19999
 Ti-Nb, superconducting in high mag. fields 3=16879
 TiNi, phase transformations and mech. props. at low temp. 3=13519
 Ti-Ni, precipitation of Ti rel. to ferromagnetic Curie temp. 3=25755
 Ti₂Ni, crystal structure, correction 3=8845
 Ti oxide anodic films, graded p-n junctions 3=4929
 Ti oxide, in M-type stars 3=11574
 Ti oxide, thin film diodes 3=17915
 TiO, diffuse refl. spectra in visible and near u.v. 3=23040
 TiO, electrical and magnetic properties, 80°-400°K 3=17894
 TiO, electronic structure 3=25235
 TiO, Franck-Condon factors, (0,0),(0,1) bands, calc. 3=15340
 TiO, ordering rel. to vacancy behaviour 3=6815
 Ti-O system, i.r. spectra 3=20491
 TiO, vacancy interaction energy 3=2785
 TiO_{1.6}-TiO₂ system, e.s.r. 3=3178
 TiO₂, defect structure, thermograv. study 3=2786
 TiO₂, dielec. props., microwave freqs. 3=13112
 TiO₂, diffuse refl. spectra in visible and near u.v. 3=23040
 TiO₂, diffusion of O and anion vacancies 3=2831
 TiO₂ doped with Fe³⁺, maser action 3=523
 TiO₂, effect of covalent binding on permittivity 3=17931
 TiO₂, elec. aging and regeneration 3=23000
 TiO₂, epitaxy on TiC 3=5092
 TiO₂, e.s.r. of Cr³⁺ 3=14798
 TiO₂, etching rel. to dislocation motion 3=11219
 TiO₂, $I \propto V^2$, polarization and space-charge effects 3=22954
 TiO₂ p-n junction films, piezoeffects 3=13127
 TiO₂ particles, melting by electron irradi. 3=3925
 TiO₂, plastic deform. 3=23328
 TiO₂, point-contact diodes 3=10854
 TiO₂, refractivities, internal elec. fields 3=20052
 TiO₂, rutile, electron energy levels, rel. to lattice defects 3=22955
 TiO₂, rutile, epitaxial growth 3=11241
 TiO₂, rutile, kc/s elastic const. 3=6772
 TiO₂, rutile, photoconductivity, polarization, and space-charge-limited currents 3=17963
 TiO₂, rutile, vibration spectrum 3=10583
 TiO₂, rutile, Co²⁺ e.p.r. 3=1183
 TiO₂, semicond., elec. conductivity 3=17895
 TiOx (x = 1.5-2.0), e.s.r., temp. depend. 3=15949

Titanium compounds — contd

- TiO₂Cu preparation and crystal structure 3=8856
 TiO₂Na preparation and crystal structure 3=8856
 TiO₂Nb₂O₅, anomalous dielec. polarization 3=22999
 TiO₂-PbO-ZrO₂ system 3=3255
 Ti₂O₃, diffuse refl. spectra in visible and near u.v. 3=23040
 Ti₂O₃, mag. structure, neutron diffr. meas. 3=15862
 Ti₂O₃, magnetoelectric effect 3=25369
 Ti-Rh alloys, superconducting transition temp. 3=21669
 Ti-Rh alloys, superconductivity crit. temp., influence of lattice structure 3=7407
 TiSe₄, crystal structure 3=1346
 Ti₂Ta, superconducting in high mag. fields 3=16879
 Ti₃Te₄, crystal structure 3=1346
 Ti-V, paramag. susceptibility rel. to temp. 3=999
 Ti-V solid solutions, electronic specific heat 3=8367
 Ti-V, superconducting in high mag. fields 3=16879
 Ti(62%)-Zr(38%), disordered, neutron, scatt. 3=17644

Torquemeters

- torsion balance for anisotropy, magnetization meas. 3=19397

Torsion

- See also Elastic constants; Stress analysis.
 cylinder, hollow, epitrochoidal cross-section 3=9379
 metals, stress, effects 3=13377
 oscillations, principal, freqn. calc. 3=7086
 vibrations, damping capacity background 3=18171
 Ag, deform., and change of elec. cond., law 3=8490
 Al, heat generation, theory and mech. 3=9380
 Fe, 700°-1250°C, microstructural changes 3=6857
 UO_{2.11}, sintered, high temp., energy balance 3=6777

Tracers

- See also Radioactive tracers; Radiochemistry.
 and diffusion in alloys, under elec. field, meas. 3=20235

Transducers

- See Acoustic transducers.

Transformations

- See Phase transformations; Thermal transformations.

Transformations, mathematical

- bi-orthogonal system of symmetric character 3=7
 Fourier, rel. to Bergmann-Weil integral for 3-point function 3=5321
 Lorentz, general transformations, axiomatic deduction 3=32
 Poisson transform. of

$$\sum_{j=1}^N F(\cos 2\pi j/N) \cos 2\pi jn/N$$
 3=21196
 Talmi, for particles with diff. masses 3=5972

Transistors

- See Semiconducting devices, transistors.

Transition metals

- adsorption, field electron micro. study 3=3369
 complexes, free, electronic structure 3=15331
 Cr group, electronic band structure 3=6492
 electron structure and mag. props. 3=2755
 electron theory, review 3=17676
 electron transfer in aqueous soln. 3=8943
 Fe group, X-ray spectra, K _{α} and satellites, temp., crystal var. 3=25475
 ferromag. direct exchange theory, suitability 3=981
 ferromagnetic, theory of neutron diffr. phenomena 3=25540
 ferromagnetism, Correlated electron wave function in 3-d band as ground state 3=15769
 fluorescence excitation by X-rays 3=953
 imbrittlement, rel. to neutron irradi. 3=8784
 ions, exchange polarization and magnetic behaviour 3=977
 ions, spectroscopy, for laser appl. 3=7330
 ions, zero-field splitting 3=25164
 ligand field spectrum, cubic, three-electron 3=25166
 magnetic susceptibility, electronic sp. ht. 3=25509
 melting points, periodicity and Tc 3=7386
 in MgOAl₂O₄ crystals, as impurity ions, energy spectrum calc. 3=20130
 nuclear magnetic relaxation 3=25595
 solution in liq. Al, kinetics 3=16614
 superconducting, specific heats meas. 3=7405
 superconductivity, s-d interaction 3=5593

Transition metals — contd

superconductivity, two-band model 3=9678

Transition metal compounds

alloys, anomalous properties 3=10715

alloys, localized electron spins 3=8393

alloys, magnetic susceptibility, electronic sp. ht. 3=25509

alloys, paramag. susceptibility, rel. to temp. 3=999

alloys, superconducting, upper crit. fields 3=3949

covalent complexes, fine structure of K-absorption spectra 3=8609

cyano complexes, overlap integral calculation 3=10529

diborides, nuclear magnetic resonance 3=10541

elec. conductivity, rel. to crystal internal fields 3=4798

magnetic ion interaction, superexchange model 3=11032

optical rotation, ligand field approx. 3=23046

orbitals, empty, 4p, localization, X-ray K-edge splitting 3=25175

oxides, conduction mechanism by internal friction meas. 3=10836

oxides and sulphides, pressure effects on elec. conds. 3=25370

oxides, vacancy interaction energies 3=22737

phosphides, binary, crystal structure 3=13453

solid solns., superconducting, size factor 3=16871

solid solutions, magnetic props. and superconducting 3=15747

sulphides, groups IV, V, VI, crystal structure, atomic, review 3=23449

ultrasonic absorption, in octahedral complexes, resonance absorption, with inversion splitting 3=25195

Transmission**acoustic waves**

See also Acoustic wave propagation.

Arctic Ocean, 90-km test. 3=25864

coal mines, hammer blow signals 3=14284

electrostatic waves in plasma, collision damping 3=16929

in sea-water, 160-200 kc/s 3=21029

static and dynamic losses of partitions 3=18954

SOFAR channel, South Atlantic, distance meas. 3=11386

underwater, effect of ocean waves 3=11385

acoustic waves, ultrasonicinto water through 3 μ Al film 3=18934**- electromagnetic waves**

See Electromagnetic wave propagation.

light

See also Absorption, light; Filters, optical.

absorbing plate, optically active, isotropic 3=16788

atmosphere, contrast reduction by turbulence 3=6962

chemical analysis, oximeter, cuvette, blood,

allowing for light scattering 3=13943

coherent, through plasmas 3=12138

contrast function, meas. using gratings 3=268

crystalline plates, principal vectors soln. 3=15649

crystals, absorbing, circular optic axes 3=15648

crystals, mag. absorbing optically-active 3=13148

crystals, transparent uniaxial, inhomog. waves 3=15642

E¹-asser band 3=15322

films, optical density 3=20934

filters, linear, non-negative signals 3=3892

grating, sinusoidal, and irregular surface 3=258

guide, fibre, for plasma meas. 3=21808

guided, coherent, by fibres, reflecting tubes, lense tubes 3=21510

i.r. by atmosphere, review 3=3468

i.r., in atmosphere 3=11409

i.r., through atmosphere, calc. 3=18550

ice (sea), rel. to porosity and wavelength. 3=13650

Irtran-1, MgF₂ 3=20480

metal films plasma resonance absorpt. 3=10634

metals, extinction theorem, plasma theory 3=17049

micas, muscovite, apparent optic angle 3=25463

multilayer dielec. films, theory 3=14360

nitrobenzol, soln. in n-heptane, absolute coeff. 3=21367

non-parallel radiation, medium with plane-parallel surfaces 3=5526

opalescent media, by light from laser 3=269

optical materials, infrared, bibliography 3=16750

optimum conditions, rel. to Beer's law 3=24041

Transmission — contd**light — contd**

plane-parallel layer, wave optics 3=9605

plane-parallel layers, nonlinear theory 3=16787

Rayleigh line structure on passing through a liquid 3=3805

sapphire, white, u.v., linear temp. dependence 3=18010

in sea, daylight penetration 3=6952

semiconductor surfaces, i.r. meas. 3=13557

simultaneous meas. of transmission and refl.

coeffs. 3=18961

single-path band factors from double-path meas. 3=14338

snow, rel. to porosity and wavelength 3=13650

solutions, extinction coeff. meas. 3=21367

suspensions of large coloured particles, interaction between

absorpt. and scatt. 3=9621

by systems of spherical particles 3=11939

test objects, variable transmittance, sinusoidal,

prod. 3=18966

by thin films, phase-shifts meas. 3=14361

transparent solids, effect of elastic deform. 3=23036

Al, vacuum u.v., 6 to 30 eV 3=13145

As₂Se₃-type glasses, 400-800 cm⁻¹ 3=10930-1

Au-Ni thin films 3=8580

Cu, films, 4-20 m μ , anomaly 3=17996Ge films, 12-60 m μ , wavelengths 0.4-0.7 μ 3=10953

Ge, vacuum u.v., 6 to 30 eV 3=13145

HgTe, i.r. 3 to 15 μ m 3=10835In films on glass substrate, 400-1000 m μ 3=25435

InAs, at liquid H temp. 3=6339

KH₂PO₄, modulated at microwave freqn. 3=5535

LiF, spectral, vac. u.v., rel. to crystal surface 3=15682

MgF₂, Irtran-1 3=20480

MgO particles, meas. on film 3=924

PbTe, i.r., 28°-296°K, rel. to carrier concentration 3=10907

S, rhombic, i.r. transmittance 3=8603

Sb, vacuum u.v., 6 to 30 eV 3=13145

SiO films, effect of evaporation rate 3=20486

Sn, vacuum u.v., 6 to 30 eV 3=13145

SnO₂, energy gap and thermal shift 3=2924**Transparency**

See also Optical constants; Transmission, light.

atmosphere, to solar i.r., 1.0-12.5 μ . 3=25888

atmospheric, anomalous and "selective", Buger's

applic. and reversion effects 3=3466

cholesterol ester, liquid crystals 3=21370

CO₂, spectral, rel. to Venus atmosphere 3=13865

gases, spectral, population shift theory 3=16662

metal films, rel. to surface impedance in i.r. 3=20434

MnCO₃, rhodochrosite 3=18267

phase-contrast and interference study 3=257

sapphire, white, u.v., linear temp. dependence 3=18010

solids, light deviation by elastic deform. 3=23036

spherocobaltite 3=18267

Transport processes

See also Diffusion; Kinetic theory; Liquids, theory;

Solids, theory; Statistical mechanics.

alloys, dilute 3=8382

in arcs, electric, of Na, Cu 3=24256

Boltzmann eqn., energy-depend., transport approx. 3=12463

Boltzmann eqn., linearized, particular solution for

plasma 3=14565

Boltzmann eqn., Lorentz gas perturbation theory approx.

soln. 3=3772

Boltzmann eqn., mathematical props. 3=13996

Boltzmann eqn., monoenergetic, variational

analysis 3=18755-6

Boltzmann's equation, relaxation-time approx.

soln. 3=14069

Boltzmann eqn., soln. for stationary states 3=18754

Boltzmann eqn., stationary, solution 3=3771

conference, Woods Hole, (1962) 3=7150

crystals, Boltzmann eqn., general soln. 3=4847

crystals, h.f., freqn. depend. 3=12937

density matrix, mono-electronic, exclusion principle

appl. 3=23794

electrolysis, Soret effect 3=13615

electron gas, Green function method, two-time 3=21759

entropy prod. 3=23780

fermions, Bogolyubov eqn. 3=21263

Fokker-Planck diffusion term 3=9374

Transport processes — contd

- Fokker-Planck equation, soln. using Campbell's theorems 3=9373
- gas mixtures, viscosity and conductivity, thermal 3=18849
- gas of rough spheres, relaxation effects 3=9495
- gases, dense, statistical mechanics 3=9497
- gases, density expansion calc. 3=3829
- gases, Kubo formulae validity 3=18850
- gases, Maxwell-Chapman method 3=3825
- gases, moderately dense 3=18846
- generalized path variable method 3=21265
- irreversible processes, thermodynamics 3=18757
- linear theory, half-space problems 3=9375
- Liouville eqns., stochastic, deriv. 3=11731
- magnetoplasma in a.c. field 3=9774
- Markov, trajectory stability 3=18736
- mass transfer, equilib-line curvature effects 3=11751
- master eqn., generalized, t-matrix expansion 3=11732
- metals, Boltzmann eqn. for inhomog. elec. fields 3=13030
- neutrons, effect of scatt. and cross-section 3=19647
- paramagnetic gas in magnetic field. 3=171
- perturbation theory, use of asymptotic wave vector 3=23764
- plasma, non-isothermal kinetics 3=7501
- in plasma, radially constricted 3=16926
- quantum fluids, homogeneous, evolution eqn. 3=23792
- quantum theory, thermal Green's functions 3=23804
- radiative transfer eqn., appl. to scatt. in turbid medium, 3=14368
- radiative transfer, penetration, diffusion 3=81
- radiative transfer problems, numerical approximations 3=21266
- relativistic extension, from conventional Boltzmann equation derivation 3=18758
- semiconductors, review 3=10731
- solids, in elec. and mag. fields, temp. grad. 3=20258
- solids, quantum mechanics 3=12938
- statistical theory using BBGKY hierarchy 3=5390
- statistical thermodynamics, range of validity 3=7151
- systematization of impulse, thermal and material exchange 3=5392
- time-dependent pair distrib. function, linear velocity-gradient 3=14150
- unstable solns. and stability criterion 3=23805

Triboelectricity

- polymers 3=6623
- Al₂O₃, effect of rubbing with Ta wire 3=2966
- NaCl, effect of rubbing with Ta wire 3=2966

Tritium

- atmospheric, artificial, inventory and occurrence in methane. 3=25895
- atmospheric content. 3=25892-3
- atmospheric, in H and CH₄. 3=25894
- in CH₄-D₂ mixtures, n-irrad., failure of elastic collision model 3=18460
- detection, propane proportional counting system. 3=25857
- diffusion of He⁴ with DT, T₂, thermal 3=21430
- fallout, in rain, var., and Sr⁹⁰. 3=25896
- Greenland ice content 3=24887
- melting, pressure-temperature equn. 3=12000
- molecule, ortho-para conversion by adsorption 3=12789
- North Pacific surface water, content 3=24888
- prod. by protons, deuterons and α -rays in Al, Pb, Zn and Cd 3=4637
- proton scatt., elastic, phase shift analysis 3=22130
- radiochemistry, in Li salts, n irrad., and thermal release 3=23552
- T⁺ ion source output 3=24376

Tritium compounds

See Hydrogen compounds.

Tritons

See also Nuclear reactions, tritons.

- asymmetry parameter, from μ^- capture by He⁴ 3=12460
- binding, three-body force effects 3=22219
- electrodisintegration, 400 MeV calc. 3=15048
- H⁴, H⁶ 3=19714
- hypertriton, analysis rel. to Λ -nucleon hard core 3=10179
- Li⁶(Li⁷t)B¹⁰, angular distribution curve 3=15167
- Li⁷(γ , t)He⁴, energy distribution meas. 3=10249

Tritons — contd

- Li⁷ photodisintegration, spectrum and ang. distrib. 3=24921
- $\mu^- + \text{He}^4 \rightarrow \text{H}^3 + n + \nu$ 3=14997
- prod. by p, at 28 GeV, with d and He³, high energy, momentum spectra, theory 3=15198
- production by 30 GeV protons on Al, Be, Fe 3=6090
- range, in polystyrene, N₂, air, Al, Ar, Ni, Kr, Xe 3=10180
- scattering, inelastic, from deformed nuclei, rel. to coupling potential 3=19885
- scattering, N-H³, and H⁴ state 3=19714
- scattering of protons, elastic, below 1 MeV 3=15047
- in Si, range-energy relationship 3=17113
- T(d, n)He⁴, neutron polarization 3=676
- T-T react. at 60-1140 keV, cross-sects. 3=6091
- wave function for ground state, variational calc. 3=4473

Tungsten

- adsorbed layers of KCl and Cl, kinetics 3=11323
- adsorption of Ba and CO, rel. to work function 3=18394
- adsorption and desorption of Ge, field emission 3=8928
- adsorption, field emission micr. study 3=13568
- adsorption of H and Xe, rel. to surface features 3=3369
- adsorption of O₂ 3=6887
- band structure from X-ray spectra 3=4979
- chemisorption of O, 20° and 300°K 3=3396
- crystal growth by recrystallization 3=13541
- crystal growth from vapour 3=23406
- cyclotron resonance 3=22692
- cyclotron resonance, 1.6°K 3=2777
- desorption of Ba by elec. fields 3=3360
- desorption of Cs by elec. fields 3=3361
- determination in W-Fe alloy 3=11278
- diffusion in α - and γ -iron 3=22818
- diffusion in Co, by electric current, 1100-1350°C 3=17782
- diffusion in W(15 at.%)—Mo, electric field, effects 3=20237
- diffusion in W, TaC, TiC—WC, TiC—WC—TaC 3=25295
- ductility rel. to Cr 3=10655
- elastic consts., 4.2°-300°K 3=13325
- electrochemical test for distinguishing from Mo and NiCoFe 3=9311
- electron emission by H⁺ ions at 1-30 keV 3=24347
- electron emission, due to He⁺, two-process model 3=4182
- electron emission, field, energy distrib. 3=12232
- electron emission, induced by laser beam 3=19304
- electron emission, secondary, by positive ion bombard. 3=24346
- electron emission, secondary, with thermal emission current 3=24343
- electron field emission, 10⁻¹²-0.1A, rel. to cryst. directions 3=14620
- electron refl. and diffr., 1-206 eV meas. 3=7645
- electronic band structure, by De Haas-Van Alphen meas. 3=6492
- energy band structure by isochromat meas. 3=15468
- etch figures, rel. to etching solution 3=20783
- explosions, flash lamp induced heating, compared with electrical, wire and strip 3=21628
- Fermi surface area from skin effect meas. 3=2757
- field desorption of N and CO, corrosion 3=18396
- field emission, prior to destruction, by high-density autoelectronic current pulses 3=7630
- filaments, deformed, particle size and strain 3=25785
- filaments, electrically heated, transient characts. 3=14627
- filaments, hot, fluctuations 3=17821
- filaments, 1710-2500°K, in cold gases, energy exchange 3=24078
- films, prep., props. 3=11316
- films, vacuum deposition, using spring-loaded conductors 3=9524
- grain boundaries, rel. to α -irrad. 3=17775
- as ion source, oxygenated surface 3=14668
- Kapitza resistance meas. 3=12017
- lattice focusing of collision sequences 3=22881
- mechanical props. and structure, anneal effect 3=11183
- microcrystals, up to 60 Å diam., surface atomic structure 3=3296
- moving edge dislocations 3=10654
- photoelectric emission, 10-50 eV 3=14631
- photon emission, on He, Ne ion bombard., 25-100 eV 3=21800

Tungsten — contd

- plastic deformation, at 1250°K 3=13368
- recrystallization kinetics 3=3333
- resistance, electrical, and work function, effect of adsorption of electropositive atoms 3=13040
- resistivity rel. to plastic deform. 3=13037
- resonance interaction with slow neutron at low temp. 3=4801
- Rn²²² ions range, 2-450 keV 3=14676
- shadowing of electron-microscope specimens 3=11329
- shock wave parameters rel. to initial densities 3=5487
- spark, far u.v. continuous emission, spectrum, spatial distrib., apparatus 3=24249
- specific heat, 1200°-2400°K 3=10596
- spectral power distrib. from colour temp. 3=7322
- spike formation on surface by Ar ions 3=22880
- sputtering, effect of ambient gas at high temp. 3=14680
- stress/strain relations, heat treatment temp. effects 3=23307
- surface adsorption, rel. to electron bombardment 3=18395
- surface, incandescent, BaO beam interaction 3=23541
- surface ionization of K 3=9733
- surface, ordered, thermal rearrangement 3=18376
- tensile properties and twinning rel. to purity of single crystals 3=25617
- thermal conductivity, phonon and electron components, separation methods 3=12930
- thermal conductivity, up to 1700°K 3=14395
- thermal expansion, 24°-526°C 3=15441
- thermionic and photoelec. Schottky deviations 3=21863
- thermionic emission, in Cs vapour, low coverage, discontinuity 3=14624-5
- thermodynamic enthalpy, 350-2000°C 3=8361
- thoriated, arc cathode 3=9755
- twinning on fracture surfaces 3=18210
- vacancies, formation and density 3=15482
- vaporization, flash heating, near u.v. spectroscopy 3=24117
- welding 3=18685
- wire, "dope-tube" formation, mechanism 3=4880
- wire, electron metallography, using C replica technique 3=18421
- wire, field ionization at surface 3=12067
- wire, relaxation damping capacity, shear modulus 3=13329
- wires, hot resistivity 3=10723
- work function, changes caused by sublimating BaO 3=19294
- work function, effect of adsorbed Ba 3=14615
- work function, effect of adsorbed N 3=12225-8
- work function meas. using GM counter 3=2015
- work function of polycryst. foil, meas. 3=9825
- work function of single crystal planes, 78°-293°K 3=12228
- work function, 311 plane, and temp var. 3=7626
- work hardening recovery by Young's modulus and internal friction meas. 3=11174
- X-ray emission linewidths, K and L α 3=3029
- W⁵⁺, e.p.r. in glasses, silicate and phosphate 3=20656
- W^{182,183}, Mössbauer effect 3=6462
- W¹⁸⁷ ions, range in W, 1.6-127 keV 3=14678

Tungsten compounds

- alloys, superconductivity 3=16873
- metal tungsten bronzes, model for electronic structure 3=15461
- Th-W, saturated emission at high currents, meas. 3=19307
- W-44 at.% Mo, ordering 3=20891
- W(15 at.%)—Mo, diffusion of W and Mo, electric field, effects 3=20237
- W nitride II, rhombohedral, chemical crystallog. 3=20842
- W nitrides, crystal structure 3=13462
- W oxide, whiskers, obs. 3=3374
- W oxides, crystal growth 3=18271
- W-20% Re, grain boundaries, rel. to α -irrad. 3=17775
- WB, crystal structure, rel. to similar types 3=18338
- WBe₂, crystal structure 3=20839
- WC, wear of sintered material 3=3247
- WC-Co alloys, Co cementing phase, packing, deformation errors 3=16117
- WC-Co, macroscopic structure, rel. to electrical resistivity 3=13497-8
- WC-Co, sintered, fracture mechanism 3=11178
- WC-Co(10%), anisotropy, from X-rays 3=6775

Tungsten compounds — contd

- WCl₅, liquid and supercooled solns., e.s.r. study 3=21407
- W-Fe, determination of W 3=11278
- W₃N₈ films, rhombohedral, structure 3=13460
- W-N system, superlattice and disordered phases 3=23451
- WO bronzes, crystal structure, sintering temp., and dielec. props. 3=25390
- WO₃, elec. props. rel. to W bronzes 3=13083
- WO₃, colloidal crystals, structure 3=18408
- W-Pt, superconductivity 3=3962
- W-Re, field ion microscope study 3=18340
- WSe₂, optical properties of single crystals 3=25466
- W_xTa_{1-x}Se₂, X-ray and thermoelec. study 3=23029

Tuning forks

See Vibrating bodies.

Turbulence

See also Cavitation; Vortices.

- air jet, energy spectra at high Reynolds number 3=5454
- air in pipes, local heat transfer coeffs. and velo. fields 3=9489
- anemometer, hot wire, streamwise and cross-stream 3=14196
- anemometer meas., hot wire, review 3=18840
- around plate, heat transfer 3=19036
- around streamlined plate, heat transfer 3=19033
- atmosphere, diffusion, generalized theory 3=9026
- atmosphere, diffusion of heavy particles 3=18496
- atmosphere, energy dissipation 3=9030
- atmosphere, lower, broad-band spectral meas. 3=3454
- atmosphere, neutral, exchange 3=3459
- atmosphere, 90-130 km, review 3=13698
- atmosphere, 60 to 110 km 3=9033
- atmosphere, surface layer, empirical data 3=3455
- atmosphere, upper 3=11420
- atmosphere, upper, detm. by rockets 3=3479
- atmospheric, effect on sound propag. over ground 3=21043
- atmospheric, specific features 3=3453
- bound layers, heat transfer 3=11968
- boundary layer flow, heat transfer 3=5410
- boundary layer, noise prodn. 3=14290
- boundary-layer, noise produced 3=18914-15
- boundary layers, noise production 3=9553
- Broszko's relations 3=116
- CO₂-H₂O system, mass transfer, conc. effect 3=16152
- conducting fluids in mag. fields 3=21951
- convection, thermal, at arb. Prandtl number 3=1853
- dissipation fluctuations 3=3789
- dissipation fluctuations in isotropic stream 3=114
- dissipation fluctuations in isotropic stream 3=5415
- dissociating gas, boundary layer 3=3819
- divergent limiting turbulent layer, static pressure distrib. 3=117
- flame, gasoline, acoustic noise power and spectral distrib. 3=11872
- flow, diffusion, resistance law, wall boundary layer 3=14100
- flow in pipes, heat and mass transfer 3=5411
- flow in porous-wall pipe 3=3784
- flow, incompressible, intrinsic eqns. 3=115
- free-convection layer along vertical plate, transition 3=277
- Friedman-Keller equations, spectral analysis 3=18785
- gas, heat exchange and frictional resistance 3=9490
- gas, skin-friction and heat transfer 3=23919
- He II, when heat current applied 3=21642
- heat and matter diffusion 3=7186
- heat transfer, velocity rel. to temp. 3=11969
- homogeneous, decay, quantum fld. theory applic. 3=5412
- homogeneous layers, stability 3=3787
- ionospheric, rel. to geomag. fld. intensification 3=3516
- isotropic, energy transfer 3=5413
- isotropic, energy transfer to small eddies 3=23922
- isotropic homogeneous, differential integ. eqn. 3=16584
- isotropic, initial response to mag. field 3=21952
- jets, coaxial, for miscible fluids, theory 3=105
- large Reynolds number, Eulerian rel. to Lagrangian scales 3=14107
- liquid columns, oscillating, viscous damping 3=119
- liquid flow in tubes 3=5420
- liquid free surface photography 3=16744

Turbulence — contd

- liquid, and scattering, light, coherent, granularity 3=19025
- liquids, heat transfer at large Prandtl numbers 3=18791
- liquids, using Ling hot-film anemometer 3=3790
- magnetohydrodynamic flow in transverse mag. field 3=21957
- magnetohydrodynamics, isotropic, theory 3=17042
- mass transfer near solid or fluid boundary 3=3791
- mesh induced, asymptotic decay, calc. 3=11754
- mixing-length theory, turbulent convection 3=21590
- noise when convected at high speed 3=11861
- non-uniform, theory 3=5414
- in pipe, mass transfer, and irreversible first-order chemical reaction 3=14103
- plasma, electrodynamic props. 3=16932
- plasma, mag. field confinement 3=9802
- plasma, quasi-equilib. processes, kinetic description 3=5662
- plasma, quasi-equilibrium processes, kinetic description 3=396
- plasma, in r.f. discharge 3=7470
- plasma, rel. to dissipation 3=7540
- plasma in strong magnetic field 3=21836
- plasma, weakly nonequil., kinetic theory 3=21844
- in plasmas 3=7523
- in Poiseuille flow, transition, simple model 3=7179
- pressure fluctuations. 3=156
- pressure resolution, by transducers 3=9484
- scalar field transported by turb., initial spectral behaviour 3=18783
- and scattering and absorption of electromag. waves 3=12315
- semiconductors, fluctuations, electrical magnetohydrodynamics 3=20280
- slicks on Lake Huron 3=7187
- solar atmosphere, acoustic noise generation 3=11540
- sound scatt. in nonisotropic turbulence 3=23986
- Spalding function, extensive calc. 3=11970
- stars, and spectra 3=18643
- stationary, homog., Lagrangian auto-correl. coeff. 3=14101
- streaming-potential fluctuations 3=23849
- suspension flow 3=101
- 3-dimensional turbulent boundary layers 3=21299
- in upper atmosphere, seasonal variation 3=13693
- wave propagation, effect on 3=23956

Twilight

- See also Atmospheric spectra; Zodiacal light.
- airglow, $1.58 \mu^1\Delta - ^3\Sigma_-$ band, theory 3=25933
- He I λ 10830 Å line, preliminary study 3=3510
- Li, abundance after nuclear explosion 3=11447
- Li⁺, high abundance, due to thermonuclear explosion, high altitude 3=18554-5
- metallic emissions rel. to atmospheric dynamics 3=13791
- N₂⁺, prod. and loss processes 3=13787
- sky brightness, effect of lunar atmosph. tide 3=6988

Twinning

See Crystals, twinning.

Ultracentrifuges

See Centrifuges.

Ultrasonics

- See also separate headings, e.g. Absorption.
- acousto-elastic effect, velo. meas., metallurgical appls. 3=23275
- Al₂(SO₄)₃.K₂SO₄.24H₂O, crystal growth, accel. 3=25668
- alloys, precipitation hardening, u.s. effects 3=16109
- amplification in semi-metals in elec. or mag. fields, theory 3=5495
- applications, review 3=9565
- atomization of liquids 3=23850
- cavitation 3=16594
- cavitation and chemical effects 3=18793
- cavitation, 500 kc/s generated, growth 3=14121
- cavitrons for cleaning 3=3238
- CdS, u.s. amplification, rel. to non-ohmic behaviour 3=12919
- cleaners 3=3236

Ultrasonics — contd

- cleaning in production 3=2817
- colloids, effect on stability, book 3=6936
- delay line, crystal, using ray deviation from wave normal 3=14264
- delay lines for d.c. pulse transmission. 3=205
- density meter for liquids 3=14089
- use in dentistry 3=16714
- development, role of piezoelectricity 3=14253
- diffraction of light by ultrasonics, phase and amplitude modulation. 3=220
- diffraction of orthogonal light wave 3=24056
- echo sounding fish recorder 3=3240
- effect on electron energy spectrum of crystal 3=15459
- elastic wave propag. along layers, two-dimensional model 3=16686
- electro-optical liquid delay lines for light modulation 3=2978
- field meas., BaTiO₃ microprobe for 1 Mc/s 3=392
- flowmeter, phase-shift type 3=410
- gyrators, piezoelectric-piezomagnetic 3=2828
- h.f. electrostatic transducers for gases 3=2804
- KMnO₄, influence on directed crystallization 3=16044
- Levavasseur whistle, evaluation and applications 3=3237
- light diffraction by u.s. waves, Fresnel region 3=9616
- light, diffraction, by wide high-frequency u.s. beams 3=24057
- liquid dielectrics, effect on dielectric props. 3=9471
- luminescence, liquids, by cavitation, u.s. 3=18819
- machinery 3=2818
- maser, optical, ruby, modulation of resonance sharpness 3=19486
- metal flaw meas., refractory disks 3=23490
- microscope, phase contrast 3=222
- microwave (1-24 Gc/s), in solids, review 3=6470
- n.m.r. stimulation, review 3=20665
- neutron-induced cavitation 3=17132
- Ni-Fe (80/20%) films, u.s. switching of magnetization vector 3=15826
- organic compounds, pulse studies 3=21355
- p.v.c., crystallite growth increase, at 1 Mc/s 3=13419
- rocks, dynamic elastic parameters meas. 3=3427
- shutter, u.s. refraction, for lasers 3=12348
- spectrum analysis using modulated light 3=2977
- transit-time meas. survey on fused silica 3=574
- u.s. fields study, BaTiO₃ microprobe 3=1777
- visualization of u.s. wave 3=14366
- and water, deionized, conductivity, electrical, increase 3=18830
- waveguides, pressure profiles 3=14263
- wave packet visualization by strobe optical system 3=11868
- wave velocities in stressed Ni steel 3=2706
- Zn crystal growth effects 3=23392
- ZnO, u.s. amplification, rel. to non-ohmic behaviour 3=12919

Uncertainty

See Indeterminacy; Probability.

Units

- See also Constants; Dimensions; Nomenclature and symbols.
- assignment, philosophical aspects, mechanical and electrical 3=13985
- astronomical unit of length, theory and meas. 3=5229
- curie, definition 3=641
- current and resistance, elec., pot., Faraday const., proton gyromag. ratio, meas., review 3=21189
- electrical and magnetic systems 3=1905
- electromagnetic, from formalized eqns. 3=12292
- electromagnetism, rationalized system, interpretation possibilities 3=5313
- metre, history and definition 3=9316
- rationalized, electromagnetic, interpretation 3=2467
- sub-multiples, femto and atto 3=9315
- temperature 3=21599
- temperature scales, thermodyn. and international 3=11981
- time and frequ., astron. definition 3=11651

Uranium

- in australites, by α -counting 3=7025
- cold rolling, X-ray line-shift study 3=8766

Uranium — contd

- conductivity electrical, var. with heat treatment, 4.2°-100°K 3=20270
 conductivity, thermal and electrical, effect of neutron irradiation 3=25325
 creep, 550°C, at tensile stress of 350 psi 3=25633
 crystal structure, temp. variations near 43°K 3=6841
 crystal structures, grains, unrefined, from ultrasonic pulse scattering 3=13496
 deformation during α - β cycles 3=1354
 diffusion of Fe, Cr, in β U 3=10691
 diffusion, self- and hetero-, review 3=8454
 ductility after work-hardening, partial annealing 3=6795
 film preparation 3=8925
 irradiation creep, mechanism 3=2795
 irradiation growth after mechanical working 3=8480
 irradiation growth rate eval. 3=6310
 isotope separation, nozzle, by adding He 3=15309
 isotopic analysis 3=18999
 neutron absorpt., effective reson. integral 3=2544
 oxidation, in air at increasing temps. 3=3250-1
 phase transformation, α - β 3=25652
 phase transformations, up to 45 kbar pressures 3=8795
 phase transition, α = β , mechanisms, review 3=5129
 photoelectric emission 3=5694
 plastic deformation, single crystals, -196°C, tension 3=15989
 powder, ignition study 3=6916
 resistance, electrical, anisotropy, α -form 3=22899
 resistivity of interstitial atoms and vacancies in α -U 3=25326
 structure rel. to anisotropic thermal expansion 3=10606
 surfaces, total emissivity 3=14413
 swelling, irradiation, under mech. restraint 3=12712
 thermal expansion, anomalous below ~ 43°K, and conductivity, electrical 3=20270
 thin films prepn. for neutron cross-section meas. 3=11321
 vapour pressure, effect of oxygen 3=3930
 U, anisotropic irradiation growth prediction 3=4898
 α -U, atomic positions, 22°-600°C 3=25705
 α -U, crystal structure 3=8837
 α -U, dislocation loops, orientation 3=20181
 α -U, Frank dislocation formation 3=2794
 U-graphite reactor fuels, fission products loss 3=12737
 α -U, plastic deformation by rolling, 550°-640°C 3=13370
 α -U, thermal cycling during creep, incremental collapse 3=8908
 U⁴⁺ e.s.r. in CaF₂, SrF₂ and BaF₂ 3=3180
 U⁴⁺, Slater-modified Hartree-Fock calc. 3=12767
 U²³³ fuel prep. for reactor 3=15267
 U²³⁸, pore size and distribution, caused by fission gases, 200°C 3=22457

Uranium compounds

- alloys and cpds, self- and heterodiffusion, review 3=8454
 dicarbide, heat content 1484° to 2581°K 3=15438
 dumontite, crystal structure 3=16086
 mX⁺⁺O.UO₃.nH₂O, general structural, formula 3=3305
 nitrides and sulphides, review of phys. chem props. 3=16473
 oxides, valency, from X-ray M_V emission spectrum last lines 3=23558
 sklodowskite, crystal structure 3=16085
 uranyl acetate, absorption bands analysis 3=8282
 uranyl nitrate, absorption bands analysis 3=8282
 UAl₃, n.m.r. of Al²⁷, band structure 3=8730
 UAl₃, n.m.r. of Al²⁷, Knight shift 3=3192
 UAl₃, nuclear fission fragment damage, electron microscope examination 3=13015
 UC, elastic constants, by pulse-echo technique 3=25599
 UC, films evaporated from, work function 3=4179
 UC, interatomic distances 3=20843
 UC powder, Xe diffusion 3=2834
 UC, props, rel. to prep. 3=7079
 UC₂, interatomic distances 3=20843
 UC₂, neutron diffract. & paramag. scatt. analyses 3=1328
 UC₂ (tetragonal) and U₃C₂ (cubic), geometrical relationship 3=3324
 U₂C₃, interatomic distances 3=20843
 UC-HfC solid solubility at 2000°C 3=25759
 UC-ZrC₄, work function 3=14616

Uranium compounds — contd

- UC₁₁, electronic configuration and valency 3=13237
 U-Cr alloys, transformation curves, by isothermal dilatometer 3=6858
 U-Cr, grain refinement by continuous cooling 3=3322
 UD₃, β -modification, magnetization, paramag. suscep. and magnetothermal effects 3=6692
 U fluorides, pentavalent, near i.r. absorption spectra 3=18011
 UF₄ films on UO₂, optical interference 3=24042
 UF₆, n.m.r., polycrystalline 3=18153
 UF₆, F¹⁹ n.m.r. 3=23256
 UF₆, U isotope separation, nozzle, by adding He 3=15309
 UFe₂, ferromag. props. 3=1113
 UFe₂, ferromag. props. and comparison with theory 3=15791
 UH₃, β -modification, magnetization paramag. suscep., and magnetothermal effects 3=6692
 UH₃ and UD₃, magnetothermal effects and magnetization per mol., 4.2°, 77-4K 3=8673
 U-Mo alloy, γ -quenched, annealing 3=5135
 U-Mo, superconducting in high mag. fields 3=16879
 U-Mo two-phase alloys, electron micr. study 3=5154
 γ U-6 at.% Mo, kinetics of isothermal decomp. 3=25764
 U-Nb alloys, phase transformations rel. to cooling 3=8894
 U-Nb, γ - β transformation rel. to cooling 3=8888
 U-Nb, superconducting in high mag. fields 3=16879
 U-Nb, transformation of β -phase 3=16100
 U oxalate, coprecipitation with Ca 3=1275
 U-O bond, force const., in UO₂²⁺, from K₃UO₂F₆ spectrum, i.r. 3=22575
 UO₂, creep deformation 3=25632
 UO₂, crystal structure, by neutron diffr. 3=20844
 UO₂ crystals, U precipitation 3=13591
 UO₂, dislocations 3=17733
 UO₂, elec. props. in single crystals, 90°-900°K 3=25372
 UO₂, evolution of structure during fuel rod irradiation 3=25650
 UO₂ films, energy of fission fragments 3=4678
 UO₂ films, fission fragment tracks 3=822
 UO₂, fission fragment tracks 3=17805
 UO₂ fission-induced vaporization 3=3935
 UO₂, fission products, volatile, emission 3=22440
 UO₂ fuel elements, temp. distrib. 3=10432
 UO₂, hydrofluorination, optical interference meas. 3=24043
 UO₂, inert gas release, abnormal kinetics 3=22441
 UO₂, irradiation defects, electron microscope study 3=22847
 UO₂, magnetic susceptibility 3=8642
 UO₂, microstructural changes, rel. to irradiation burn-up 3=20960
 UO₂, microstructural changes, rel. to neutron irradiation 3=20958
 UO₂, paramag. susceptibility, neutron irradiation 3=15758
 UO₂, pore distrib., sintered in H 3=11311
 UO₂, sintered, microfractographic obs. 3=3240
 UO₂, slip lines to distortion during crystal growth 3=25285
 UO₂, solid soln. formation with foreign elements in U₃O₈ → UO₂ transform 3=25765
 UO₂, stoichiometric, creep deform. 3=8773
 UO₂, thermal atomic motions up to 1100°C 3=20845
 UO₂, sintered, high-temp. torsion 3=6777
 UO₂-U₃O₈, elec. props. rel. to phase transition 3=25371
 U₃O₈, magnetic susceptibility, to determine valency 3=8642
 U₃O₈, geophysical prospecting, γ -ray log, computer analysis 3=21027
 U₃O₈, magnetic susceptibility, temp. var. 3=8642
 U₃O₈-x, "out-of-step" structure 3=811
 U₃O₈, thermal expansion, up to 1026° 3=15445
 UOS, antiferromagnetic props. 3=15731
 UOS, mag. props. and structure 3=13283
 UOS, mag. susceptibility temp. var., two Curie consts., explanation 3=5760
 UO₄.2H₂O, proton resonance and chemical structure 3=3203
 UO₂-ZrO₂, a.c. elec. conduct. meas. 3=10882
 α U-Pu, lattice consts. at room temp. 3=25733
 U-Pu-C ternary system, below 635°C 3=25748
 U-Pu-C ternary phase diagram below 50 at.% C 3=25747
 U salts, rel. to sound cavitation in water 3=18794

Vacuum apparatus

- See also Glass—metal seals.
- anti-emission materials with thoriated W cathodes 3=9523
 balance, micro, quartz crystal 3=18774
 cold trap, mains-operated filter 3=18867
 contamination, silicone 3=14229
 demountable seats and heat-resist. valves 3=14230
 for electron ejection, Auger, from solid surfaces 3=14619
 fluid-free stainless-steel system, 10^{-10} torr 3=23945
 gas collection and meas., grease-free apparatus 3=9521
 gate valve, with large aperture 3=23953
 glass contamination, effect on breakdown 3=9759
 ion-injection magnetic mirror device; vac. system. 3=185
 joints, cylinder and ball and socket, for Hg manometer 3=18869
 lead-in electrode, exchangeable 3=23952
 liquid nitrogen traps, automatic refilling 3=18868
 magnetic vacuum valve improvements 3=1740
 seals, O-rings with blank-off threaded plugs for unused feedthrough holes 3=9520
 thermocouple, Mo and Kovar fused to glass 3=24092
 traps, copper, for ultra high vacua 3=5475
 tube materials, monitoring of props. 3=9522
 ultrahigh vacuum, review. 3=180
 ultrahigh vacuum in small glass systems 3=3840
 vacuum evaporator for ultra-high vacuum range 3=23954
 valve, bakeable, high-conductance, using 6 in. steel ball 3=1739
 valve, large, ultra-high vacuum 3=7255
 valve, packless, all-metal, for 743°–77°K 3=7257
 valves, u.h.v., bakeable 3=3843
 window seal, for gas laser 3=22026
 zeolite oil vapour trap introduction 3=14226

Vacuum gauges

- Alphatron, using radioactive materials 3=5469
 Bayard—Alpert with additional differential collector 3=21458
 Bayard—Alpert, change of X-ray limit 3=5470
 Bayard—Alpert, contaminants, by omegatron mass spectrometry 3=21460
 Bayard—Alpert, increased pumping action, rel. to adsorption 3=16669*
 Bayard—Alpert and magnetron, pres. meas. $<10^{-10}$ torr 3=23951
 Bayard—Alpert, sorption, ion, Ar, N 3=23946
 Bayard—Alpert, total pressure meas., $<10^{-9}$ torr 3=5474
 fast ion gauge for neutral ion density nr. confined plasma 3=24297
 hot-cathode magnetron ionization, improved 3=14227
 ionization, B—A, elec. clean-up 3=16670
 ionization, Bayard—Alpert, ultra-high vacuum use 3=11843
 ionization (Bayard—Alpert) with photocurrent suppression 3=18865
 ionization-gauge filaments, protection 3=5472
 ionization gauge sensitivities, mass spectrometric determ. 3=23950
 ionization, hot-cathode, resistive-film elimination 3=23949
 ionization, meas., effects of adsorbed oxygen 3=21462
 ionization, re-emission of ionically pumped Ar 3=9518
 oil-filled manometer 3=9519
 oil, sloping limb, out gassed by mag. stirring, down to 5×10^{-8} torr 3=21459
 omegatron, as mass spectrometer 3=5474
 Pirani, differential, for dynamic pressure meas. 3=1736
 readings, interpretation 3=16671
 thermocouple, circuit diagram 3=5473
 Hg manometer, joints, cylinder and ball and socket 3=18869
 Hg, shortened 3=1737
 P I G reflex pulse discharge, measurement of temp. 3=24229

Vacuum pumps

- charcoal, active as sorbent for 10^{-3} mm Hg 3=18866
 clean metal surface pump 3=23948
 condensation, H, large, for u.h.v. 3=182
 cryogenic pumps, physical principles 3=11841
 diffusion pump baffle, circular chevron 3=18863

Vacuum pumps—contd

- diode type getter ion pump for inert gases 3=14224
 free-molecular flow through clearance with one moving wall 3=1716
 getter ion, mechanism and development 3=18864
 getter—ion, Ti or Zr, review. 3=181
 ion getter, circuit diagram 3=5471
 ionization, for ultrahigh vac. in small glass systems 3=3840
 ionization, re-emission of Ar 3=9518
 pumping at solid surfaces 3=21454
 sorption, multisurface, molecular sieve 3=16668
 speed, Ti, high temp. electrode effects 3=23947
 Toepler, liq. Sn, for transfer of high purity He 3=7254
 ultrahigh vacuum, effect of fore-vac. conditions 3=11842
 ultrahigh vacuum in small glass systems 3=3840
 vapour pumps, process affecting efficiency 3=1735
 He condensation, for mag. trap evacuation 3=21456
 Pd or PdAg diaphragm, heated, for H 3=14225
 Ti, construction. 3=183
 Ti, for mass spectrometers 3=16994

Vacuum technique

- adsorption and desorption in partial and ultra vacua 3=18862
 automatic pumping system 3=21455
 balance, torsion micro, for high-vacuum work 3=7166
 book 3=5596
 charcoal, active, as sorbent for 10^{-3} mm Hg 3=18866
 chem. analysis of residual gas, ion source, negative 3=21012
 counters, semiconductor, surface protection against Hg vapour 3=22043
 deposition of Cs, K, Rb, Na 3=11844
 deposition of supercond. films, vapour sources 3=9525
 deposition, optical monitoring 3=11845
 electric breakdown, by particle impact on electrodes 3=380
 electron gun, high-power 3=14649
 evaporation, glass surface contamination 3=21461
 evaporation method without irradiating object to be coated 3=21178
 evaporation on to organic films, prep. 3=25773
 evaporation, optical monitoring 3=11845
 evaporation source, for refractory materials 3=5553
 evaporation, sources, reflection 3=16135
 films, solid, residual stress control 4=23566
 freeze-drying of tissues with thermoelectric unit 3=11619
 friction meas. at ultrahigh vacuum 3=25647
 generation of clean surfaces 3=23499
 gettering, electrical in low-pres. discharge in steel vessel 3=7461
 high-voltage armoured lead-in 3=3697
 kinetic theory, appl. 3=9499
 magnetic trap evacuation by He condensation pump 3=21456
 for mass spectrometers 3=16994
 mass spectrometry, review 3=12263
 metals, films refractory, deposition, using spring-loaded conductors 3=9524
 microbalance, helical tape, for use in high-vacua 3=21284
 nitrogen sorption on Ti films 3=23520
 in nuclear physics, handbook 3=2146
 omegatron, use for press. meas. in vacuum 3=3841
 oxide film deposition method 3=23955
 purging chamber of contaminants 3=14223
 remote-opening device for vac. systems in rockets 3=3842
 selector valve with one knob 3=1738
 sliding seal 3=7256
 ultra-high vac. technology, review (in Japanese). 3=179
 ultra-high vacuum, production with oxide semiconductors, under electron bombard. 3=21457
 ultrahigh vacuum, review. 3=180
 vacuum circuit analogy with electric current circuit 3=21452
 AgCl, outgassing props. 3=18870
 Cs, deposition 3=11844
 H₂ vapour pressure measurement, 1.4×10^{-6} to 6.5×10^{-8} torr, 4.2° to 2.5°K 3=12008
 K, deposition 3=11844

Vacuum technique — contd

- Mb, films, deposition, using spring-loaded conductors 3=9524
- Na, deposition 3=11844
- Pt films by induction heating evaporation 3=19005
- Rb, deposition 3=11844
- Si evaporation and film fabrication 3=20927
- Ta, films, deposition, using spring-loaded conductors 3=9524
- W, films, deposition, using spring-loaded conductors 3=9524

Vacuum tubes

See Electron tubes.

Valency

- Mn, in α and β brasses 3=23140
- NdCd₁₁ 3=13237
- Tl in TlI₃, from isomorphism with NH₄I₃ and CsI₃ 3=11263
- U carbides 3=20843
- U in U₃O₈, from mag. susceptibility 3=8642
- U oxides, X-ray M_V emission spectrum last lines 3=23558
- UCd₁₁, electronic configuration and valency 3=13237

Van Allen radiation

See Atmosphere, radiation belts.

Vanadium

- atom, V III spectrum meas. 3=8195
- cathode, fluorescence yield by X-ray photoeffect meas. 3=6663
- crystals, neutron diffraction spin-orbit interaction 3=18294
- diffusion, in liquid cast Fe, by electrolysis 3=5431
- electronic and nuclear polarization by slow neutron scattering 3=18057
- films, superconductivity 3=19109
- hardness and grain size, var. with annealing temp. and deform. 3=5137
- i.r. properties, rel. to electron groups 3=17977
- internal friction from ordering of impurities 3=20697
- phonon spectrum investigation by neutron scattering 3=17641
- plastic deformation at low temps. 3=13351
- sound velocity, effect of high mag. field 3=8356
- supercond., thermal conductivity 3=1904
- thermoelectric power, 4.2°-340°K 3=13140
- vibration spectra and spec. heat, calc. 3=12914
- V³⁺ embedded in Si, e.s.r. 3=20639
- V³⁺, e.s.r. in CaO 3=3181
- V³⁺ spectrum in octahedral coord. crystal 3=12768
- V³⁺, in corundum, mag. suscept. 3=20548
- V³⁺ ions, e.p.r. in Al₂O₃ (corundum), hyperfine transitions, calc. 3=20659
- V⁵⁺, line broadening of P³¹ n.m.r. absorpt. in H₂PO₄ 3=13316
- V⁵⁺, n.m.r. in Cr-V alloys 3=8741

Vanadium compounds

- oxides, energy spectrum, current carriers 3=6605
- spinels, prep. and elec. and mag. props. 3=12934
- V alloys with Ti, Cr, Tc, Knight shifts 3=3204
- V alum, trivalent, mean electric susceptibility 3=20049
- V-base solid solns., mag. suscept. 3=18062
- V system, i.r. spectra 3=20491
- V³⁺ hydrated salts, paramag. behaviour 3=6691
- VB, paramag. props (150-800°K) 3=1124
- VC, dissociation press. and thermodynamic props. 3=1386
- VC, work function 3=14616
- V₂C, supercond. invest. down to 1.98°K 3=7406
- V-Co-Fe alloys, mag. props., effect of elastic stresses 3=3115
- V-Cr, paramag. susceptibility, rel. to temp. 3=999
- V-Cr solid solutions, electronic specific heat 3=8367
- V-Fe alloy, atomic magnetic moment by neutron diffraction 3=1105
- V-Fe alloys, average ferromagnetic moment 3=11055
- V-Fe, ferromag., localized electron spins 3=8393
- V-Fe, mag. susceptibilities and n.m.r. meas. 3=23141
- V-Ga, films, diffusion, supercond., transition temp. 3=16880
- V₃Ga, Knight shifts, 1-8° to 300°K, rel. to superconductivity 3=336
- V₃Ga, supercond., evidence for negative surface energy models 3=5591

Vanadium compounds — contd

- V₃Ga, superconductivity and mag. props. 3=14455
- V₃Ga, wires, supercond., transition temp. 3=16880
- V-H alloys, internal friction, H conc. depend., -190° to +210°K 3=23286
- V-Ni solid solutions, electronic specific heat 3=8367
- V-O, spectrum, i.r. absorpt., vibr., structure 3=22574
- VO, metal-to-insulator transition, effect of press. 3=1254
- VO²⁺ ions, n.m.r. in aqueous solutions 3=14187
- V₂O₃ crystals, resistivity meas. 3=2927
- V₂O₃, metal-to-insulator transition, effect of press. 3=1254
- V₂O₃-V₂O₅, phase diagram, magnetism 3=15779
- V₂O₄ ultra fine particles, antiferromag., susceptibility meas. 3=1095
- V₂O₅, e.s.r. of partially reduced crystals 3=15950
- VOCl₂, aqueous solution, e.s.r. line shape rel. to conc. & temp. 3=150
- VOCl₂ dil. solns., e.p.r. hyperfine line width 3=5451
- V₂Se₄, crystal structure 3=1346
- V-Si, films, diffusion, supercond., transition temp. 3=16880
- V₃Si films, prep. and supercond. props. 3=3967
- V₃Si, supercond., evidence for negative surface energy models 3=5591
- V₃Si, superconductivity, effect of elements replacing V 3=335
- V₃Si, superconductivity and mag. props. 3=14455
- V₃Si, wires, supercond., transition temp. 3=16880

Vaporization

- See also Boiling point; Condensation; Distillation; Evaporation; Heat of vaporization; Thermal transformations; Vapour pressure.
- atomic absorption spectroscopy, and flame mechanism 3=699
- bubble dynamics from exponentially heated surfaces in a liquid 3=12004
- entropy and enthalpy, rel. to condens. coeff. 3=19070
- latent heat, reliable, Hagenmacher method 3=16840
- metals, diffusion-limited rates 3=24120
- solid, porous, steady-state model 3=24118
- solids, rel. to dissociation of diatomic mols. 3=740
- steam-water globules interact., mech. and thermodyn. 3=297
- van der Waals theory, distrib. functions 3=12006
- van der Waals theory, one-dim. model 3=12005
- wires, rel. to elec. cond. 3=8488
- As, porous, Knudsen cell model 3=24118
- B in d.c. arc, volatilization 3=19220
- B₂O₃, thermodynamics 3=25809
- C, by laser, 30 MW, photographic obs. 3=21627
- He-H, vapour-liquid equilb. and temp. corr. 3=24112
- Hf and HfO₂ 3=7390
- In₂O₃, mass spectrometric investigation 3=12010
- LiBO₂, thermodynamics 3=25809
- Li₂O, thermodynamics 3=25809
- UO₂, fission-induced, fragment collection 3=3935
- W, flash heating, near u.v. spectroscopy 3=24117

Vapour density

See Density, gases.

Vapour pressure

See also Humidity; Vaporization.

- cis-, gem-, and trans-dideuteroethylenes 3=8247
- correlation of data for Hg, Li, Na and K 3=14423
- crystal, formula for T_g 3=5557
- crystal, monatomic 3=14428
- cyanocetylene 3=7216
- 1, 2-difluorobenzene 3=8291
- equation, non-linear const. determ., graphical 3=14421
- Group III-V semiconductor, with Group IV substituents 3=22758
- isotope effects, intermolecular mechanics 3=22614
- isotope mol. mass distrib. effects 3=19073
- isotopic effects rel. to mol. structure 3=21632
- isotopic molecules 3=8247
- isotopic molecules 3=8248
- isotopic mols., expt. and theory review 3=21631
- Kelvin reln. to surface curvature, test 3=23860
- molecular flow in isothermal enclosure 3=14201
- monodeuteroethylene, isotope effect 3=8248
- organic coolants for nuclear reactors 3=19072

Vapour pressure — contd

- polyvinylcarbazol in benzol, curve 3=8920
 selenides, containing radioisotopes 3=24116
 Ag + Bi alloys, liquid 3=14422
 Ag—Cd alloys, Cd vapour 3=13522
 B₂ 3=305
 Bi liquid 3=9662
 CaF₂ 3=12007
 Cu—Ag alloys, rel. to vibr. entropies of Ag 3=12922
 GeTe, 683°–837°K 3=295
 H₂, para 3=14424
 Kr^{82,86}, saturated vapour press. diff. 3=21633
 S vapour, partial pressure of S₂ 3=13587
 SO₃, and H₂O—SO₃ system 3=9663
 SbBr₃ 3=21629
 SbI₃ 3=21629
 Sc 3=24119
 SiF₄ 3=21636
 SnSe, 773°–898°K 3=21637
 SnTe, 792°–933°K 3=21637
 U, effect of oxygen 3=3930
 Xe^{130,136}, saturated vapour press. diff. 3=21633
 ZnSe, 1060°–1393°K meas. 3=1871

Vapour pressure measurement

- acetone, saturated, apparatus 3=19071
 by differential thermal analysis 3=9660
 at high-temperature, by semimicro-balance 3=5401
 Knudsen effusion technique 3=24119
 mass spectrometric, partial, many-components 3=24113
 mercury reservoir for demonstrations 3=151
 selenides, Knudsen method 3=24116
 solids, porous, interpret. of Knudsen results 3=24118
 up to 20 kg/cm² and 500°C 3=19072
 Cr in Cr—Ni—Al alloys, 1060°–1300°C 3=1872
 Cs, with Bayard—Alpert ionization manometer 3=19076
 H₂, 2.5° to 4.2°K, u.h.v. conditions 3=12008

Variable stars

See Stars.

Variational calculus

See Mathematics.

Vavilov—Cherenkov radiation

See Cherenkov radiation.

Vectors

- div B = 0, rel. to lines of induction 3=19395
 vector analysis, applied to photographic and optical response data 3=16723

Velocity**acoustic waves**

- See also Dispersion, acoustic; Helium, liquid, sound propagation; Shock waves.
 in air 3=5497
 ammonium perchlorate, granular, columns, longitudinal 3=20091
 argon, up to 150 atmospheres, 300°C 3=7242
 bosons, interacting, system 3=23802
 Fermi system, sing-part.Green's function 3=7147
 gas mixtures, calc., classical 3=16656
 liquids, mixtures, organic, var. 3=16622
 liquified gases in capillary tubes, low temps. 3=1683
 metals, longitudinal, effect of mag. field 3=4808
 metals, phase, in external mag. field, calc. 3=4820
 neopentane—C₅H₈, neopentane—C₅H₁₂ mixtures, var. 3=16622
 nitrogen, up to 500 atmospheres, 500°C 3=7242
 oceanographic, calc., data precision 3=18487
 in solid solutions, with solute particles or cavities, dispersion 3=2727
 solids, calc. from elastic const. 3=20110
 in water-filled sands 3=23987
 Ag, effect of high mag. field 3=8356
 Al, effect of high mag. field 3=8356
 Ar 3=16659
 in Ar 3=5497
 Ar gas 3=9505
 Au, effect of high mag. field 3=8356
 BeO crystals 3=10884
 CCl₄—C₅H₈, CCl₄—C₅H₁₂ mixtures, var. 3=16622
 C₅H₈—CCl₄, C₅H₈—C₅H₁₂, C₅H₈—neopentane, C₅H₁₂—CCl₄, C₅H₁₂—neopentane mixtures, var. 3=16622
 Cu, effect of high mag. field 3=8356

Velocity — contd**acoustic waves — contd**

- H₂ and D₂, -175°C to 150°C, up to 2500 atm 3=23930
 He³, 0.02°–0.3°K, rel. to melting curve 3=14437
 Hg amalgams, rel. to composition 3=16604
 Kr 3=16659
 N gas 3=9505
 in N₂ 3=5497
 N₂, gas 3=16659
 NaCl, effects of Li⁺, I⁻, Rb⁺, Ag⁺, Br⁻, K⁺ impurities 3=22644
 O₂ gas 3=9505
 O₂ gas 3=9506
 PbZr_{0.95}Ti_{0.05}O₃, and phase transform. Fe₁-Fe₂ 3=15618
 Ta, effect of high mag. field 3=8356
 V, effect of high mag. field 3=8356
acoustic waves, ultrasonic
 See also Dispersion, acoustic, ultrasonic.
 cellulose acetate in acetone 3=14161
 concrete samples, "sing-around" technique 3=21502
 esters, 20 Mc/s, 10°–50°C 3=11795
 ethyl cellulose in methyl alcohol 3=14161
 gases, liquified, temp coeff. rel. to mol. wt. 3=7204
 glass, optical, elastic constants, temp. var. determ. 3=5058
 in glasses, high temp., differential path method 3=7294
 high temp. meas. 3=18936
 irons, cast, decrease during cooling from 1000–700°C, and graphite formation 3=23473
 in liquid binary mixtures 3=9455
 liquid, freezing, nucleus size, by anomalous increase 3=18251
 in liquids at low temps. 3=21357
 liquids, compressed 3=18813
 liquids, rel. to internal pressure, theory 3=21358
 lithium halides, aqueous solutions 3=18812
 longitudinal mode, in Ta rod 3=1772
 megacycle freqs., effect of nonparallel sample faces 3=23984
 in metal nitrate electrolytes 3=9456
 metals, molten, temp. coeff. rel. to mol. wt. 3=7204
 near resonant absorption, by u.s. paramag. resonance 3=6759
 nitrate electrolytes, aqueous 3=11792
 org. liquids, temp coeff. rel. to mol. wt. 3=7204
 polymer solutions 3=14161
 polyvinyl acetate in benzene 3=14161
 pulse-echo method of meas. 3=21501
 pyrite, pulsed waves 3=23280
 quartz, X-cut, to 10 Gc/s 3=18934
 relation to thermodyn. functions and compressibility 3=7395
 seawater, 500 kc/s, small changes, meas. instrum. 3=13651
 sea water, Mediterranean, Jan. 1961 3=3442
 steel samples, "sing-around" technique 3=21502
 stressed solids, var. meas., metallurgical appls. 3=23275
 in waveguides, metallic water-filled cylinders 3=18925
 A, at 3500 atm, 3.5 Mc/s 3=1728
 Bi, oscill. changes, with var. mag. field, 4°K 3=8402
 CaCO₃, and elastic const. 3=23278
 CoSO₄.7H₂O 3=20690
 Cu—Ag, and elastic const. 3=23276
 Cu—Au, and elastic const. 3=23276
 Cu—Ni and elastic const. 3=23276
 Cu—Pb, and elastic const. 3=23276
 FeSO₄.7H₂O 3=20690
 Ge, n-type, and electron and hole scatt. 3=13063
 H₂, liquid, normal and para, rel. to pressure 3=23880
 H₂, meas. and rotation-relax. freq. 3=14212
 H₂, 25.2°C and relax. times for rot. degrees of freedom 3=14213
 H₂S, 25°C, 10⁷–6 × 10⁴ c/s atm, and time for rot. degrees of freedom 3=14213
 He, at 3500 atm, 3.5 Mc/s 3=1728
 LiF, liquid, 890–1040°C 3=5440
 MgO, near resonant absorption, by u.s. paramag. resonance 3=6759
 MgSO₄.7H₂O 3=20690
 N₂ at 3500 atm, 35 Mc/s 3=1728

Velocity — contd**acoustic waves, ultrasonic — contd**

- NaF, liquid, 1025-1160°C 3=5440
- Ni alloys, high, and elastic consts 3=23277
- $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$ 3=20690
- Ni-steel, rel. to stress 3=6471
- PbS, 80-640° K, along [100] and [011] 3=20090
- Rb halides, aqueous solns. 3=16623
- Si, p-type, and electron and hole scatt. 3=13063
- $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ 3=20690

light

- conformal coords. for space-like motions 3=11682
- Michelson-Morley experiment, alternative deduction 3=5345
- moving source, Kantor's expt., relativistic explanation 3=18957
- one-way, 2nd order constancy, rel. to special relativity 3=5344
- receiver velocity, effect of 3=7303

Velocity analysis, particles

See Particle velocity, analysis.

Velocity measurement

See also Angular velocity measurement; Stroboscopes.

- γ -rays, constancy, by positron annihilation 3=22098
- gaseous detonation wave, with interferometer. 3=198
- in liquids, local vels., hot-wire anemometer 3=14090
- pitot tube performance, supersonic flow, rarified 3=14197
- sputtered atoms, time of flight 3=14681
- stroboscopic, bullet, teaching demonstration 3=21286

acoustic waves

- attenuation equipment modification 3=3858
- in liquid-filled capillary tubes, low temps. 3=1683
- sing-around velocimeter, errors 3=14281
- in small samples, by gated modulator 3=18938
- velocimeters, sea-going, calibration 3=3860
- HCl, in critical region 3=18859
- in Ni-Zn ferrite, 5 Mc/s 3=17652

acoustic waves, ultrasonic

- "sing-around" technique for large solid samples 3=21502

light

- Einstein's postulate test, comments 3=23996
- i.r. precision spectroscopy 3=248
- interferometry, rel. to atomic consts. 3=14305
- moving sources, secondary re-emission in "ballistic" theories 3=18958
- μ_0 , ϵ_0 det., teaching expt. 3=5508
- uncertainty, statistical estimate by geodimeter method 3=11878

Vibrating bodies

See also Crystals, lattice mechanics; Elastic waves; Pendulums; Piezoelectric oscillations.

- acoustic radiation damping 3=16673
- amplitude meas. of oscillations 3=23957
- bar, cylindrical, semi-infinite, plastic strain wave propag. 3=5484
- bar, whirling, axial vibrations 3=9529
- bars, crest and extremal statistics 3=5479
- bars, longitudinal oscillation with uniform stress 3=191
- beam, mass-loaded cantilever, response crests distrib. 3=5477
- beam, rotating, transverse vibs. 3=18878
- beam, whirling Rayleigh type 3=18879
- beams, free-free, damped, transverse vib. 3=7262
- beams, mechanical impedance and transmission 3=9530
- beams, rectangular, torsional vibrations 3=192
- beams, transverse vibs. 3=18882
- cantilever beam, random loading 3=18880
- circular plate with central hole 3=21467
- conical bar, longitudinal vibs. 3=187
- coupled plates 3=18875
- crystal plate, infinite, monoclinic, at high freqs. and long wavelengths 3=5480
- crystal plate, infinite, monoclinic, freq. spectrum 3=5481
- cube, natural longitudinal vibs. 3=18876
- disk, rotating, symmetric planar vibs. 3=18874
- disks, design for mechanical radiation 3=7263
- earth, free, spheroidal, long-period, calc. 3=18468-9
- elastic plates, flexural vibs. 3=9533

Vibrating bodies — contd

- elastic solid, after impact of rigid circular cylinder 3=94
- elastic-strip, plate-wave phase velocities 3=18873
- ferroelectric cylindrical tubes, vibration theory 3=11846
- flat plate, flexural vibrations, finite amplitude 3=16677
- isolation mountings, 2- and 3-element, transient behaviour 3=9536
- Jacobi, Maclaurin and Jeans spheroids, stability 3=16681-4
- magnetostrictor, dissipative forces 3=19411
- membrane, infinite composite 3=21465
- membranes, composite circular 3=21466
- membranes in air 3=5478
- piezoelectric plate, natural freqs., static deform. 3=16678
- piston face, equivalent Eulerian boundary conditions 3=21464
- plates, bending wave propag. 3=9531
- plates, circular, elastic, non-linear 3=18872
- plates, piezoelec., thickness vibs. 3=7267
- plates, rectangular orthotropic, analogy with buckling 3=16676
- prisms, natural longitudinal vibs. 3=18876
- quartz crystals, internal displacements, by X-ray diffr. 3=15982
- quartz disks, extensional vibs. 3=5482
- α -quartz plate, acoustic mode propagation 3=20087
- quartz plates, thickness vibs. 3=7267
- rectangular plates, isotropic and orthotropic 3=23959
- resonant cantilever beams, fatigue tests 3=7261
- resonant vib., relation bet. strain and vel. 3=9528
- ring segment, clamped, circular, out-of-plane vibrations 3=18871
- rod, thin, propag. of elastic disturbances 3=14232
- rods, bending wave propag. 3=9531
- sandwich plates, extensional vibr., h.f. 3=189
- sandwich plates, nonlinear flexural vibr. 3=188
- shell, elastic, cylindrical, response to moving shock wave 3=7260
- shells, cylindrical, point-driven. 3=190
- shells, dynamic asymmetry 3=9532
- spherical shells, flexural vibs. 3=7265
- spring, damped, transient response to pulselike displacements 3=9535
- string, nonlinear continuous, exact soln. 3=186
- structure, continuous, response to random loading 3=9534
- system with redundant coord., force consts. 3=8233
- vibration control by resilient mounts 3=14231
- BaTiO_3 circular disk, thickness mode 3=20389
- Pb, resonance peaks, rel. to dislocation motion 3=1220

Vibrations

See also Acoustics; Damping; Oscillations; Vibrating bodies; Waves.

- air-filled, thin walled cylinders, circumferential waves 3=7271
- bimodal system, response crests distrib. 3=5477
- crest and extremal statistics, square-law-derived random process 3=5479
- dynamics of excited rigid strip mass on an elastic half space 3=18770
- films, thin, thermal 3=4810
- heat transfer increased by transverse vibs. 3=5545
- linear monatomic chain, effect of anharmonic potl. 3=23735
- magnetoelastic, cond. plate and bar in a mag. field 3=16679
- magnetoelastic, cond. plate in a mag. field 3=16680
- mechanical impedance, mobility, analytical expressions 3=7259
- nonlinear asymm., under random loading 3=16675
- non-linear system activated by periodic force, sufficient condition of stability 3=9526
- nonlinear, under random loading, analysis 3=16674
- prolate-spheroidal shells, axisymmetric vibs., perturb. soln. 3=1744
- resonance testing with n degrees of freedom 3=1745
- rigid bodies in elastic medium, rotation 3=7264
- rod, thin, propag. of elastic disturbances 3=14232
- shock waves, vibration relax., calc. 3=23969
- skin sensitivity 3=3648

Vibrations — contd

- stress tensor, asymmetric, continuous medium, mechanical and e.m. fields 3=19420
- theory, differential equations, integration 3=18697
- thermoelastic, isentropic motion, finite deform. 3=18883
- torsional, damping capacity background 3=18171
- unloading waves theory 3=18887
- vibration—impact system, model tests 3=23823
- water, reservoir, effect on acoustic phase 3=16709

excitation

- Aeolian tones generation, fluctuating forces on cylinder 3=1770
- beams, by central and off-centre forces 3=18882
- branches of trees, by acoustic waves 3=18926
- cantilever beam, response spectrum 3=18880
- cylindrical shell, elastic, by shock wave 3=18881
- microwave, elastic, prod. by ferromag. resonance 3=23958

measurement

- See also Seismology.
- automobile noise, instruments 3=14292
- internal friction, freqn. modulation technique 3=7258
- power, elastic, waveguide, standing wave amplitudes and freqs. 3=166672

Viscoelasticity

- See also Plasticity.
- bitumen, penetrometer for routine testing 3=1226
- consolidating medium with spherical cavity 3=91
- cylindrical wave in viscoelastic solid 3=1748
- dilatational constants, determ. by vibrating sphere 3=21476
- dynamic yield conditions for materials 3=11738
- elastoplastic bar, impact on rigid barrier 3=1644
- flow in tube, axial stress at wall 3=11772
- flow thro. tube, dimensionless groups 3=11771
- fluids, axially-symmetric flow 3=11770
- glass, review of expts. 3=13334
- liquid, Rayleigh problem 3=18790
- liquids, flow, helical, single relaxation line 3=18789
- liquids, short-memory, flow problems 3=11768
- non-Newtonian liquid, coeff. detm. 3=16590
- polyisobutylene 3=11167
- polymer solns., hydrodynamic interaction effects 3=18810
- polymer solutions at high pressures, u.s. measurement 3=14156
- polymers, mol. weight effects, theory 3=23339
- polymers, semi-crystalline, relax. spectra 3=15978
- polymers, temporarily cross linked 3=11309
- polymers, temporarily crosslinked, theory 3=16125
- polymethyl acrylate monolayers 3=16126
- polymethyl methacrylate monolayers 3=16126
- polyvinyl acetate monolayers 3=16126
- rubber-like polymers 3=11167
- rubber, relation to friction 3=16013
- shear waves propag., viscoelastic medium 3=11852
- solids, dynamic props., meas. 3=13371
- stress tensor for isotropic materials 3=7159
- thermodynamic theory 3=1658
- vibrating sphere, viscoelastic waves, dilatational const. 3=21476

Viscometers

- calibration, NBS oil samples, 0.02-450 P 3=9421
- capillary, kinetic energy correction term 3=109
- counter balanced sphere, for molten oxides, up to 1750°C 3=14116
- for gases, over range of temp. and press. 3=7223
- gases, transpiration through capillary 3=14191
- penetrometer for routine testing of bitumens 3=1226
- review 3=14113
- rotating cylinder, with stability modulation 3=1664
- using rotating solids of various shapes, test 3=1663
- for N_2 compressed to 5000 bars 3=14190

Viscoplasticity

See Plasticity.

Viscosity

- n-amyl acetate, time changes, electric current and field effects 3=18808
- attapulgit suspension in water 3=11362
- Bingham fluid behaviour in cone-and-plate viscometer 3=14114

Viscosity — contd

- effect on water flow in canals 3=9431
- equilibrium fluctuations, collective motion theory 3=7140
- flow surfaces in general relativity 3=14099
- flow through porous media, three-point correl. 3=1670
- fluid flow, thermodynamic theory 3=1658
- fluid, viscous, in elastic tube 3=5404
- lubricating oils, reduction at high shear stress 3=9422
- macromolecules, effect of partial draining 3=4791
- non-Newtonian liquid, transverse, coeff. 3=16590
- polymethylmethacrylate in diphenyl solution, shear rel. to shear stress 3=16619
- quantum statistical gas, dilute 3=6468
- and Rayleigh number, critical, variable viscosity 3=21297
- relation with diffusion coeffs. in Lamm's theory 3=21326
- rubber, theory, integrals 3=11186
- snow, meas. 3=3440
- solns. of rigid rodlike molecules 3=135
- sphere rotating in non-Newtonian viscous liquid 3=111
- steady-flow, and steady-state compliance, from creep data 3=25636
- Stokes flow of sphere 3=9424
- suspensions, aggreg. and liq. penetration effects 3=11360
- suspensions, thermodynamic theory 3=8984
- thermodynamic theory 3=18766

gases

- air, teaching, meas. 3=21425
- binary mixtures, determinant elements in 2nd approx. 3=21438
- binary systems, use for diffusion coeff. determ. 3=7231
- and flow, through porous materials, air, rarified 3=9483
- kinetic theory, Maxwell—Chapman method 3=3825
- kinetic theory, relativistic, for simple gas 3=23927
- Kubo formulae validity 3=18850
- mixtures, and conductivity, thermal 3=18849
- mixtures, formulae, semi-empirical 3=11829
- molecular gas; first and second viscosities 3=1727
- rel. to spectral line breadth and sound velocity 3=16660
- A—He mixture 3=168
- Ar, oscillating disc meas. 3=14189
- Ar, ratio of η with specific heat 3=11832
- Ar, - 78.5° to 100°C, below 200 atm. 3=7223
- CO₂, oscillating disc meas. 3=14189
- He, oscillating disc meas. 3=14189
- Kr 3=9494
- N₂, at 127 atm. and low temps. 3=14191
- N₂, oscillating disc meas. 3=14189
- N₂, - 78.5° to 100°C, below 200 atm. 3=7223
- N₂, up to 5000 bars 3=14190
- Ne, oscillating disc meas. 3=14189
- Ne, - 78.5° to 100°C, below 200 atm. 3=7223
- Ne—He mixture 3=168

liquids

- See also Lubrication; Superfluidity.
- alcohols, rel. to dielectric relaxation 3=21398
- alcohols, shear viscosity, temp. depend. 3=21309
- anomalies in very thin capillaries 3=7195
- deuteromethane 3=11762
- during evaporation, viscous flow mechanisms 3=21320
- elastico-viscous parameters meas. by rotating sphere 3=23840
- electrolyte solutions, effect of dielec. const. 3=21341
- electrolytes in mixed solvents 3=16612
- flow problems, short-memory liquids 3=11768
- highly viscous, test of rotating viscometers 3=1663
- liquefied gases, kinematic fluidity 3=1673
- macromolecules, solutions, as a function of vel. gradient 3=14157
- meas. from longitudinal waves in a wire 3=9539
- measurement by rotation of sphere 3=23839
- metals, anomalous, fluidity and prefreezing cluster formation 3=9437
- metals, high temp., activation energy 3=21602
- methane, liquid, kinematic meas. 3=9423
- methyl siloxanes, shear viscosity, temp. depend. 3=21309
- organic, temp. depend., structural data 3=21312
- paraffins, shear viscosity, temp. depend. 3=21309
- polar mols. in dilute soln. 3=23896
- poly-1-butylene-benzene solns. 3=21352
- polymer solns., conc., entanglement effects 3=18809

Viscosity — contd**liquids — contd**

- polymer solns., near critical temp. 3=21349
- polymer solns. in poor solvents, mol. wt. depend. 3=21350
- polymer solutions, rel. to temperature 3=18811
- polymers, high 3=7203
- polymethylmethacrylate solns., rel. to mol. weight 3=134
- polystyrene-cyclohexane solns. 3=21352
- review 3=14112
- solutions, rel. to luminescence quenching 3=16632
- solvent, effect on excitation energy transfer between unlike mols. 3=23887
- suspensions, spheres, polymethylmethacrylate, macroscopic, dilute, non-Newtonian 3=18788
- ternary mixtures 3=23841
- time of rise in capillary method 3=1662
- uranin, in organic solvents, rel. to fluoresc. polariz. 3=139
- water, absolute viscosity 3=11761
- water, distilled, flow through pipes 3=108
- water, rel. to "free volume" 3=11780
- Al, fluidity and prefreezing cluster formation 3=9437
- Al₂O₃-CaO slags 3=5424
- Ar, liquid, kinematic meas. 3=9423
- Ar-methane system, meas. and calc. 3=7185
- Ar-Kr mixtures, kinematic fluidities 3=1673
- Bi, ultrasonic study 3=9457
- Co 3=14115
- Cr³⁺ salt solns, rel. to e.p.r. line width 3=3818
- Fe 3=14115
- GaAs, at and above m. pt. 3=5448
- H₂SO₄, aq. soln., meas. at 25°C 3=9448
- HeII, bet. 0.79°K and λ point 3=14434
- He³, 0.14-2.1°K meas. 3=16849
- Hg, ultrasonic study 3=9457
- InAs, at and above m. pt. 3=5448
- Kr, liquid, kinematic meas. 3=9423
- Kr-methane system, meas. and calc. 3=7185
- Li^{6,7}, effect of isotopic mass 3=125
- Ne 3=21310
- Ni 3=14115
- O₂, liquid, kinematic meas. 3=9423
- P₂O₅, above and below m.p. 3=21311

Visibility

See Atmospheric optics.

Vision

See also Colour vision; Eye; Stereoscopy.

- achromatic foveal thresholds 3=11639
- adaptation, dark and light, initial stages 3=5297
- after-effects in perception, review 3=1569
- afterimage phenomena, continuous negative, spatial enhancement 3=16458
- after-images, reson. not seen normally 3=9310
- ametropia, aniseiconia and intracamerall corr. 3=240
- angular displacement of feedback of motion 3=1566
- appearance of anodized Al surfaces 3=16480
- artificial, using fibres 3=11626
- black line segments on bright background 3=11630
- blur-to-sharp transition, quantitative aspects 3=11632
- brightness, apparent, cyclic fluctuation 3=11636
- brightness contrast and inducing stimulus output 3=21172
- brightness function, adaptation effect 3=7074
- brightness memory 3=11629
- contour sharpness, subjective 3=16463
- contrast and assimilation effects, anomalous 3=5301
- contrast resolution rel. to target oscillation 3=3689
- critical flicker frequency, effect of wavelength 3=11634
- critical flicker frequency and phased surrounds 3=13967
- dark adaptation, following glare 3=7072
- dark adaptation, subjective brightness 3=11638
- defocussed contours, sharpness 3=1563
- directional sensitivity, retinal, effect of topically administered drugs 3=21174
- discrimination and orientation, summary 3=16457
- discrimination processes, neural theories 3=5299
- discriminatory functions, neural effects, review 3=5300
- distance of distinct vision, age depend. 3=16462
- electroretinogram, spectral sensitivity rel. to stimulus duration 3=3687

Vision — contd

- entoptic scatter, contrib. of cornea 3=16459
- expts. with goggles, eye's correction for distortion 3=1568
- flicker, light time fraction and surround luminance 3=18679
- flicker stimuli, harmonic analysis 3=1567
- fluctuation of ambiguous figures 3=23718
- fluctuation theory of brightness discrim. 3=5303
- Graham, Edgar D. Tillyer medalist 3=21184
- human eye, foveal sensitivity in near i.r. 3=16456
- inductive brightness depression, configuration conditions 3=18682
- intensity judgment, inborn ability 3=13959
- light-dark boundary, thresholds rel. to viewing time 3=23720
- moon illusion 3=11628
- moon illusion, terrain effects as cause 3=1570
- motion, cessation, sensitivity to velocity 3=11633
- movement, real and apparent aspects 3=21173
- moving object, diff. distances, eyes fixed 3=7073
- on and off response differences 3=21175
- perception lag rel. to stimulus luminance 3=13971
- perceptual fluctuations with ambiguous figure 3=9308
- photic flicker sensitivity 3=13969
- positive after-images, retinal receptors role 3=13970
- psychophysical linking hypotheses 3=9305
- quantum and energy based visual sensitivity 3=13968
- quantum theory 3=3686
- resolution and contour interaction 3=21171
- retinal image formation, optical and motor factors 3=5294
- retinal image formation, optics, review 3=5293
- retinal p_H value, significance 3=9309
- scotopic b-wave, rise and decay varn. 3=3688
- shutter for square-wave exposures 3=14326
- size and distance, relative, primary importance 3=18681
- size meas. by microscopy, visual factors 3=23719
- stereopsis, and binocular rivalry of contours 3=18680
- subjective sharpness and contrast thresholds 3=1562
- tactile receptor theory 3=16461
- temporal gradients, subjective discrim. 3=9307
- threshold during eye movements 3=1571
- time varying stimuli, retinal electrical response 3=11627
- twilight, threshold conditions 3=16464
- two intersecting stripes darker than background, and alignment acuity 3=13966
- velocity discrimination, effect of cues 3=3690
- visibility of fixed or stabilized object, rel. to eccentricity 3=11631
- visual masking, intensity and contour effects 3=3692
- visual measurement, general theory 3=5296

Vitreous state

See also Glass.

- ether-ethanol irradi., e.p.r. of carbazole donor diphenyl acceptor mixtures, 77°K 3=22595
- in inorganic aqueous solns., D substitution, effect on transformation temp. 3=23492
- metals, heavy, halide salts solutions, luminescence 3=10990
- polyacenes, luminescence, delayed, 77°K 3=20535
- polyethylene 3=3350
- polymer fracture, kinetics under external load, calc. 3=20731
- polymers, crazes, refractive index meas. 3=8579
- polypropylene, atactic and isotactic, glass transition 3=10597
- polyvinylcarbazol in benzol, v.p. curve 3=8920
- quartz particles, effect of grinding 3=8918
- spodumene, crystallization, from Raman spectra 3=5086
- vitrification, quantitative theory 3=23491
- zero-point entropy 3=11304
- As₂S₃-As₂Se₃-As₂Te₃, atomic structure, corrections 3=18363
- As₂Se₃, short-range order 3=10802
- As₂Se₃-As₂Te₃, atomic short range order 3=18364
- C, preparation and use as crucible material 3=21181
- Na borate glass, structure of solid and liquid 3=1361
- Tl₂SeAs₂Te₂, photoconductivity, thermoelectricity 3=20418

Volume measurement

No entries this year

Vortices

- See also Cavitation; Turbulence.
 bath-tub 3=16593
 curved filament, progressive deformation 3=1657
 earth's rotation effect 3=9430
 meas., forces by vibrating cylinder 3=14120
 plasma vortex rings 3=395
 transformations, by identity system 3=16592
 vortex motion, in transport process systematization 3=5392
 vortex street development, numerical soln. 3=18782

Water

- See also Ice; Seawater; Steam.
 acoustic impedance, 3.2 Gc/s 3=18934
 acoustic wave, plane progressive, prod. by quartz transducer 3=16705
 adsorbed on glass, dielectric behaviour 3=17950
 adsorbed on LiF, dielectric admittance 3=10880
 adsorption in AgI-KI-H₂O 3=23522
 adsorption on n-type Ge powder 3=6890
 atmosphere, saturation vapour press. rel. to density, intermolecular attractions 3=18495
 boiling, cooling nichrome wire, in centre of glass pipe 3=9661
 Cherenkov radiation on γ -irrad. 3=2239
 compressibility, adiabatic, lowering by LiNO₃ 3=18807
 condensation from water vap.-inert gas mixture 3=14425
 conductivity, electrical, deionized, increase by ultrasonics 3=18830
 of crystallization, loss, exo-electron emission during 3=5689
 crystallization of supercooled, use of Ag I 3=11398
 density, 20×10^6 atmospheres 3=21100
 detonation pressure meas. and eqn. of state 3=1751
 dielectric const., Onsager's equations, refr. index choice 3=14176
 dielectric polarizability, temp. var., cavity radius, from refractive index 3=23899
 diffracted light, frequency shifts 3=7210
 diffusion of butanol, trajectories, finite cell 3=18806
 diffusion in Na carboxymethyl cellulose gel 3=1403
 diffusion in solids, new meas. method 3=8448
 diffusion, vapour, in air, teaching, meas. 3=21425
 distilled, sea, heavy, light absorption 3=16626
 distilled, viscosity, in flow through pipes 3=108
 double refraction in strong shock waves 3=7205
 drop, Leidenfrost phenomenon at 100°-500°C 3=7389
 drop shapes under low gravity, 1 litre in contact with Zn stearate plane 3=18668
 droplets, vapour exchange with environment 3=294
 drops, 15-500 μ m radius, prod. by vibrating capillary 3=14132
 drops, internal circulations 3=14133
 drops, submicroscopic, freezing point 3=5082
 dynamic contact angle with air sat. with water vapour 3=1672
 electron irrad., ionization distrib. 3=14532
 evaporation thro. monomolecular films 3=24114
 flow, in canals, effect of viscosity and capillarity 3=9431
 flow, in plastic tubes, noise, acoustic 3=5505
 flow in porous media, electrokinetic phenomena 3=16596
 flow, viscous, rel. to dipole orientation 3=21399
 "free volume" and viscosity 3=11780
 gamma-ray scatt., ang. and energy distrib. 3=14936
 γ -ray scattering, energy distrib. 3=10076
 heavy, scattering of slow neutrons 3=9445-6
 heavy-water manufacture, Sweden 3=4688
 heavy water, molecular u.v. absorption spectrum 3=8276
 heavy water prodn. from ammonia distillation 3=8940
 hydrated electron, absorption spectrum 3=6926
 ionization potential, higher, using electron impact
 Foxgun 3=14520
 ions, mobility, in O₂-H₂O mixtures 3=12080
 luminosity due to detonation transmission 3=21379
 magnetic susceptibility, protons contrib. 3=23907
 mol. structure det. from moments of inertia 3=2597
 molecular, 1s_{ns}¹ state, molecular orbital calc. 3=22561

Water — contd

- molecules, electron density distribution 3=12843
 molecules, force consts. and internuc. distances, one-centre calc. 3=22564
 molecules, in crystals, flip motion, n.m.r. 3=23268
 molecules, u.v. absorption spectrum 3=8276
 motion from expanding cylinder 3=107
 movement in porous materials 3=11819
 n.m.r., in zeolite, calc. 3=11126
 natural in hydrologic cycle, D content variation. 3=25898
 neutron diffusion hardening, det. 3=6016
 neutron diffusion, 0, 20°C 3=6017
 neutron diffusion, 0°-80°C meas. 3=4401
 neutron diffusion, poisoned, var. with poisoning, Cd, B 3=22141
 neutron inelastic scattering study, 25°-75°C 3=127
 neutron scatt., hindered rotation theory 3=17284
 neutron scatt, small-energy rotational transitions 3=23869
 neutron transport in water and heavy water 3=2272
 neutrons, fast, scattering 3=7865
 noise, acoustic, falling 3=21503
 in nuclear reactors, fission, radiolysis 3=15265
 ocean-atmosphere exchange, Antarctic 3=9027
 in organic solvents, proton exchange rates and H-bonding 3=9449
 planet, Mars, atmosphere, vapour, particle layers 3=18603
 proton hydration enthalpy 3=21337
 proton magnetic resonance, in zeolites 3=5452
 radiation nucleation of bubbles 3=23864
 sea-water distillation using fast reactor 3=19902
 solubility of inert gases 3=23877
 solubility of O₂ and N₂, isotope effect 3=9450
 sorbed on Ca hydrosilicate, state investig. by n.m.r. 3=11127
 sound cavitation, U salts effects 3=18794
 spectrum, Landé factor and electric dipole moment sign 3=22562
 structure, at room-temperature 3=9444
 supercooling, by dispersion as emulsion, small volumes 3=16837
 supersaturated vapour, growth of small ions 3=21712
 surface gravity waves, model 3=16595
 surface structure 3=21307
 surface structure, criticism 3=14139
 surface tension, effect of N₂ and Ar, 1-120 atm 3=18795
 in synthetic substances, n.m.r. 3=6768
 u.s. absorption, meas. by radiation pressure method 3=21361
 vapour, absorpt. bands 125°-200°C 3=15348
 vapour, adsorption in graphite 3=13569
 vapour, adsorption on insoluble metal halides 3=1381
 vapour, in atmosphere, 15-20km, abundance detm. 3=9020
 vapour, condensation on Au substrate 3=21635
 vapour fluorescence, possibility 3=9513
 vapour glow discharges, ion forms 3=7480
 vapour, h.f. resistance 3=9515
 vapour, interaction with low-energy electrons 3=16902
 vapour, non-isothermal diffusion 3=11820
 vapour, nucleation theory, emendations 3=14428
 vapour, strength of ν_3 vib. 3=15347
 vapour, total absorbance in near i.r. 3=23933
 vapour, Townsend discharge, photon absorption 3=4029
 vapour, u.s. absorpt., relaxation time 3=18857
 viscosity, absolute 3=11761
 water-glycine-KCl, diffusion parameters 3=1681
 water vapour, in M-type stars 3=11574
 wave damping by monomol. films 3=5423
 wave scattering, initial, by inhomogeneous medium 3=7272
 waves, dispersion 3=23851
 waves, Hamiltonian method 3=23580
 waves, shallow, profile and velocity components 3=7188
 zeolitic, spin-lattice relaxation time 3=21415
 CO₂-H₂O system, in turbulent motion, mass transfer, conc. effect 3=16152
 D₂O detection in H₂O, i.r. analysis 3=23561
 D₂O¹⁸, liquid, density, thermal expansion up to ~80°C, melting point 3=14144

Water —contd

Fe^{2+} , Fe^{3+} , soln., electron transfer between ions, theory 3=14178

$(\text{H}_2\text{O})_4$ cubic complex properties 3=23868

H_2O^{18} , liquid, density, thermal expansion up to $\sim 80^\circ\text{C}$, melting point 3=14144

Wave mechanics

See Quantum theory.

Waveguides

See Electromagnetic wave propagation, guided waves.

Waves

See also Acoustic waves; Elastic waves; Electromagnetic waves; Liquid waves; Magnetohydrodynamics; Seismic waves; Shock waves.

amplification, travelling wave, mechanical analogue demonstration 3=21191

attenuation in dispersive medium 3=7093

axially symm., linearized compressible flow 3=18701

axially symm., plane boundary conditions 3=18702

circumferential, in thin-walled air-filled cylinders in water 3=7271

crystallization waves in supercooled phosphorus 3=9658

cylindrical wave in viscoelastic solid 3=1748

diffraction, by transparent wedge 3=14001

diffraction image on focusing, correl. 3=16495

electric breakdown wave propag. in gases, theory 3=1956

electrohydrodynamic, at fluid-fluid interface 3=475

electrons, velocity modulation 3=16981

fluctuating, scattering by large objects 3=18703

fluids, rotating, energy transfer by wave reflection 3=11758

fluids, stratified, including gravity and rotation effects 3=21295

generalized "cross-correl" field quantities 3=21203

gravity, standing axisymmetric, on water, period 3=11376

Hamiltonian method 3=23580

Huyghen's principle, relationships with propagation, isotropic medium 3=16496

hydromagnetic, waves in inhomog. fields of constant direction 3=17034

interior and boundary value problems 3=22

liquid layer between elastic half spaces, e.f. 3=23960

long, one-dim. propag. theory 3=14023

magnetohydrodynamic, of finite amplitude 3=5828

plasma shock-tube phenomenon, fast dynamical 3=1955

plastic, in elastoplastic medium 3=1749

in prestressed elastic solids, uniqueness 3=21471

propag. in solids, mech. impulse excitatn. 3=1747

propagation, developments, conference 3=11675

propagation, geometrical methods and asymptotic expansions 3=21463

propagation, isotropic medium, relationships with Huyghen's principle 3=16496

propagation, space and time isotropy, in 4 dimensions 3=5332

propagation thro. turbulent wake 3=23956

scattering, initial, by inhomogeneous medium 3=7272

sea, refraction, numerical calc. 3=13654

sea surface, eqn. of state where large waves demolish small 3=9013

in sea, wind-caused, freq. spectrum of energy 3=9012

simple harmonic, spatial problem 3=11847-8

sinusoidal curve, segment spectrum 3=11849

solids, anelastic, visco-elastic, plastic and shock waves, review 3=21477

Sommerfeld - Runge law in 3 and 4 dimensions 3=21

in thermal convection, damped 3=24084

unloading, theory 3=18887

water, dispersion 3=23851

water, shallow, profile and velocity components 3=7188

water surface, gravity, model 3=16595

water waves height meas. 3=14084

wave eqn., approx. soln. 3=21195

H_2O , Hamiltonian method 3=23580

Waxes

carnauba, production of electret state 3=17947

paraffin, electret effects meas. 3=8566

Wear

alloys, high temp., decrease due to oxide layer 3=20764

brittle crystals, abrasion, friction rel. to wear 3=11188

carbon brush materials 3=20761

Wear —contd

electrographite 3=8787

graphite, on metals mechanism 3=6806

graphite, on steel, effect of current, mechanism 3=6805

initial rel. to stationary effect in vacuum 3=18220

ionic crystals, "friction damage" 3=11189

machine, on electron microscope 3=20762

measurement using radioisotopes, review 3=1248

metallic, mild-severe transition, surface films 3=16011

sapphire on steel, erratum 3=11191

steel, case-hardened, heat treated 3=1247

Bi, abrasive wear, effect of brittle fracture 3=13386

Sb, abrasive wear, effect of brittle fracture 3=13386

WC, sintered material 3=3247

Weather

See also Meteorology.

and atmospheric electricity pot. gradient, Poona, IGY 3=18514

ocean-atmosphere energy transfer, Antarctic 3=9027

"red noise" power spectrum 3=16539

Weighing

See also Balances.

vacuum microbalance techniques, conference, Los Angeles (1962) 3=21281

Wetting

See also Contact angle; Heat of wetting.

of porous system 3=20922

Wind

airflow on windward side of ridge 3=9028

in atmosphere, truncation errors 3=1432

barotropic zonal currents, dynamic instability 3=6955

in clouds, C6 cells, up and down, by radiosonde balloon 3=13673

cold air mass spilling over mountain ridge 3=9032

eddy currents, k.e. variations rel. to jet stream 3=9029

eddy fluxes, quasi-horizontal, 25-60 km 3=18497

hurricane, steady-state, rel. to thermal structure. 3=25881

hurricanes, forces and radial accel. 3=5199

hurricanes, water distribution 3=25882

indirect probing techniques using radar 3=5188

ionospheric 3=9077

ionospheric, radio measuring method 3=9076

Japanese research 3=11391

jet streams 3=21035

in lower ionosphere, meteor trails study 3=16277

in mesocyclone, meas. 3=9063

noise, acoustic, in trees 3=21503

ocean waves, crit. height values, calc. 3=18483

radar meas. using Doppler effect in rain or snow 3=1433

shear, rise of isolated thermal 3=5198

60 to 110 km, exhaust trail obs. 3=9033

stream function calc. from vertical motion. 3=25879

surface stress determination 3=11396

troposphere, upper, at mesoscale freqn. 3=16215

turbulence spectra over waves, meas. 3=25880

upper atmosphere, meas. April 1961 3=9062

upper atmosphere, night, from chemiluminescence. 3=25918

upper stratosphere, rel. to lower level movements 3=3458

velo., horizontal, 6-12 km, statistics 3=18502

Wolfram

See Tungsten.

Wood

No entries this year

Work function

See also Electron emission.

change due to adsorbed monolayer 3=24328

changes during gas adsorption on metal films, meas. by static capacitor 3=9824

electrode in Cs plasma, rel. to thermodynamic chemical potential 3=21820

electron gas, free, rel. to sample size 3=15475

films evaporated from UC 3=4179

ionic crystals, thermionic emission, calc. 3=12227

meas., vibrating electrode, adaptation for contact potential 3=16970

metals, films, effect of adsorption of electropositive atoms 3=13040

Schottky effect, periodic deviations, numerical analysis 3=424

Work function — contd

- thermionic cathodes, surface distrib., electron misc. meas. 3=2010
- Au films, photoelectric 3=426
- BaO, films, on W, var. with temp. and deposition time 3=19296
- BaO films, on W, var. with temp. and deposition time 3=19297
- Cl on W 3=11323
- CuNi, GM counter meas. 3=2015
- Ge, after exposure to oxygen 3=4174
- Ge, films, in ultra-high vacuum 3=20309
- Ge, surface inhomogeneities meas. with electrode 3=2896-7
- HfB₂ 3=14616
- HfC 3=14616
- HfO₂ 3=14616
- KCl on W 3=11323
- MgO, rel. to secondary electron emission 3=14637
- Ni, films, effect of adsorption of Ba 3=13040
- Re 3=21856
- Re, with adsorbed Th 3=21856
- Si, photoelectric emission, rel. to doping 3=9833
- Ta, Co covered surface 3=14623
- UC—ZrC₄ 3=14616
- VC 3=14616
- W, changes caused by sublimating BaO 3=19294
- W crystal planes, 78°-293°K 3=12228
- W, effect of adsorbed Ba 3=14615
- W, effect of adsorbed N 3=12225-26
- W, effect of Ba and CO adsorption 3=18394
- W, films, effect of adsorption of Cs 3=13040
- W foil, polycryst., meas. technique 3=9825
- W, GM counter meas. 3=2015
- W, 311 plane, and temp. var. 3=7626
- WC, meas. by Richardson line technique 3=2011

Work hardening

- See also Cold working; Surface texture.
- alloys, ordered, theory 3=1233
- alloys, precipitation hardening, u.s. effects 3=16109
- austenitic steels 3=23483
- α-brass, dislocation arrangements obs. 3=17738
- α-brass, shear, 4.2-500°K 3=20725
- crystals, f.c.c. rel. to plastic deformation 3=23341
- Cunco I, precipitation-hardened, microstructure 3=20895
- Cunife I, precipitation-hardened, microstructure 3=20895
- deformation ageing, dislocation theory 3=20723
- f.c.c. crystals, calc. from surface slip line meas. 3=20720
- glass, by heating and cooling 3=3229
- initial rate, low rel. to dislocation loops 3=23323
- metals, f.c.c., theory 3=23342
- metals, under cyclic strain 3=13345
- ordering alloys, strain ageing 3=8775
- steel, 410 stainless, rel. to neutron irradiation 3=11171
- steels, internal friction, temp. depend. 3=20696
- Vicalloy, precipitation-hardened, microstructure 3=20895
- Zircaloy-2, rel. to neutron irradiation 3=11171
- Ag, fatigued, correl. with slip processes 3=20748
- AgCl, strain aging 3=17718
- Al, and conductivity, electrical 3=13373
- Al, cyclic, dislocation arrangements 3=20738
- Al, recognition criteria, temp. depend. 3=3230
- Al, surface effects of dislocations 3=1232
- Al—Si alloy, effect of precipitation 3=13538
- Co—Ni—Nb alloys, age hardening 3=20724
- Cu, and conductivity, electrical 3=13373
- Cu foil crystals 3=23344
- Cu foils 3=23353
- Cu, polycryst., strain, temp. depend. 3=18201
- Cu, recognition criteria, temp. depend. 3=3230
- Cu, shear, 4.2-500°K 3=20725
- Cu, strain, vacancy cluster effects 3=25618
- Cu, under cyclic straining 3=20737
- Cu—Al alloy, elastic limit anisotropy 3=11143
- Cu—Be alloy, deformation of age hardened crystals 3=23315
- Cu—Be alloys 3=1349
- Cu—3%Co, rel. to precipitation 3=20898
- CuO—Fe₂O₃, rel. to ferrimag. props. 3=18104
- Fe, effect of neutron irradiation and temp. 3=11186

Work hardening — contd

- Fe—Cr alloys, single crystal, tensile 3=11156
- Fe—Cr, Fe—Mn, thermoelec. props. 3=2984
- Fe—Ni alloys, phase, effect on H permeability 3=18344
- KCl, quench-hardening 3=11172
- MgO, fatigue straining, dynamic recovery 3=20749
- Ni, and conductivity, electrical 3=13373
- Ni, deformation ageing 3=20722
- Ni, deformation ageing, theory 3=5072
- Ni, effect of dissolved H 3=11153
- Ni, long-term strength after hot work-hardening 3=8778
- Ni, rel. to rotational magnetic hysteresis 3=18076
- Ni, study using mag. props., hardening curve det. 3=3231
- Ni—Fe alloys, ordering, strain ageing 3=8775
- Ni₃Fe, rel. to order 3=23352
- TiO₂, temp. and oxygen-pressure effects 3=23328
- U, partial annealing, ductility increase 3=6795
- W, recovery detm. by Young's modulus and internal friction meas. 3=11174
- Zn, fatigue straining, dynamic recovery 3=20749
- Zn, fatigued, correl. with slip processes 3=20748
- Zn, polycrystalline in tension 3=18200

X-ray absorption

- See also X-ray spectra.
- crystals, calc. method 3=23436
- cylindrical crystals, secondary extinction coeffs. 3=18292
- elliptical bodies, approx. method 3=18295
- measurement, double-beam method 3=9897
- powders, meas. appar. 3=12281
- source self-absorpt., electron-capturing radio-nuclides 3=10278
- variable coeff., quantitative det. 3=21198
- Cu alloys and cpds., CuKβ_{2,5} emission 3=25474
- Cu, with CuKβ_{2,5} emission line 3=25474
- Ge, anomalous transmission 3=5099
- Ge, anomalous transmission 3=18307
- Ge, anomalous transmission, deform. effects 3=20197
- Ge, containing dislocations, anomalous 3=20947
- Ge, Cu Kα, anomalous, var. with doping 3=10975
- Ge, imag. part of atomic scatt. factor 3=11257
- Si, anomalous transmission, impurity effects 3=23098

X-ray analysis

- See Chemical analysis, X-ray; Crystal structure, atomic; X-ray crystallography.

X-ray crystallography

- For results of structure analysis see Crystal structure, atomic.
- absorption, calculation method 3=23436
- alloys with "modulated" structure 3=8879
- Au—Mn, powder patterns, phase structures 3=3312
- by anomalous X-ray transmission 3=13185
- clay minerals, phase analysis 3=13480
- conference, inorganic and intermetallic crystals, Birmingham 1963 3=25683
- conference, Leningrad, June 1961 3=11243
- diffraction, dynamical theory, origin 3=3287
- diffraction, dynamical theory, recent developments 3=1301
- diffuse diffraction, optical analogue use 3=25698
- distorted crystals, dynamical diffraction, theory 3=13440-1
- extinction, exper. determination and reduction to minimum 3=1291
- f.c.c. crystals with stacking faults, diffrn. patterns 3=18299
- fluorescent X-ray emission during diffraction 3=10972
- intensity calc. after refl. by dislocations 3=5063
- lattice distortion relaxation curves 3=3288
- Laue—Bragg refl. rel. to point defect distrib. 3=8829
- line broadening, variance as a measure of 3=5096
- macromolecules of biological importance, review 3=23438
- multiple diffraction, systematic, in equi-inclination Weissenberg geometry 3=3285
- NH₃—Ni cyanide complexes, powder patterns 3=1406
- Ni, atomic scatt. factors, in metallic state and in NiO 3=25704
- non-diagram lines 3=23084
- oriented high-molecular substs. 3=13438

X-ray crystallography — contd

- origins and historical development 3=25682
- powder diffraction patterns, standard, 37
 - substances 3=18324
- powder photographs, interpretation 3=16065
- reciprocal lattice concept demonstration 3=5095
- reflection, anomalous extinction effects 3=8828
- reflection of hard rays from bent crystals, rel. to line shape 3=6835
- spot dimensions, on single-crystal photos, rel. to block size, disorient. and lattice non-uniform. 3=20826
- thermal diffuse scattering in perfect crystals 3=11252

apparatus

See also X-ray monochromators; X-ray spectrometers.

- adaptation of single-crystal oscill. camera for X-ray texture studies 3=13430
- automatic single-crystal diffractometer 3=11244
- camera for structural defect meas. 3=25693
- camera, high temp., melting point calibration 15-800°C 3=16054
- camera, oscillating type, for single crystals 3=8819
- camera, powder, Debye-Scherrer 3=6943
- crystal sphere orienter for non-opaque crystals 3=8821
- device for $K\alpha_2$ influence elimination 3=18291
- diffractometer attachment for direct obs. of thin films 3=20812
- diffractometer, computer-controlled 3=23425
- diffractometer, focusing attachment 3=25690
- diffractometer, for high-temp. studies of metals 3=2067
- diffractometer, Philips, stepping mechanism, adaptation 3=6830
- diffractometer, two-circle, for diffuse diffraction abs. meas. 3=11245
- diffractometer, with Bragg-Brentano focusing, sample eccentricity effect 3=25692
- diffractometers, single-crystal, automatic, review 3=8818
- diffractometers, 3 types, faults, comparative study 3=16056
- extinction micrographs of single crystals 3=5094
- fibres, specimen holder 3=13432
- furnace and mount for single-crystal goniometer 3=18287
- goniometer, specimen holder 3=13434
- goniometer, three-circle, uses 3=1277
- goniometer, 3-circle, geometric props. 3=18288
- goniostat, full circle, for diffrn. intensity data 3=8822
- microfurnace for single-crystal X-ray camera 3=20813
- monochromators, use of 3=2069
- mosaic spread width, reflection curve 3=13428
- Philips powder camera, conversion for single-crystal use 3=13431
- polycrystals analysis under high pressure 3=20815
- proportional counter recorder 3=23427
- single crystal diffractometers, conference 3=13429
- specimen-rotating and oscillating device 3=20814
- Weissenberg, equi-inclination osc. photographs, for instability studies 3=11249

calculation apparatus

- line profile analysis, step scan, automatic 3=19392
- programme, digital, powder pattern reduced quadratic form 3=23433

calculation methods

- automatic-diffractometer programmes 3=25684
- bond lengths and angles, programme for Elea 9000 computers 3=3294
- calculating apparatus, programme 3=6836
- centrosymmetric crystals, third set of coordinates 3=8832
- crystallite size distrib., from X-ray line broadening 3=13442
- cylindrical crystals, secondary extinction coeffs. 3=18292
- Debye factor of line weakening 3=13437
- Debye powder diffraction lines, analysis of positions 3=13446
- Delaunay algorithm transform. for parallelepiped quadrilateral figure 3=18231
- diffraction peak broadening, Fourier analysis, computer programme 3=23435
- graphical extrapolation tetragonal structures, lattice parameters 3=6837
- imperfect crystals containing dislocations, anomalous transmission 3=20947

X-ray crystallography — contd

calculation methods — contd

- indexing powder photographs, Lipson-Hesse difference method, most probable differences 3=20825
- intensities, statistical analysis 3=23430
- intensity correction and parameter calc., programmes for IBM 1620 computer 3=3295
- lattice parameter corrections, due to residual stresses and formation of solid solutions 3=6834
- lattice parameter determ. by centroid method 3=16064
- least-squares and differential synthesis, refinements 3=8833
- least-squares refinement, standard deviation estimates and accel. device 3=13443
- line breadths, peaks, correct. for $\alpha_1\alpha_2$ doubling 3=11254
- minerals, with mixed-layer structure, Fourier analysis technique 3=20832
- Mo, anomalous dispersion corrections 3=6833
- monoclinic powder patterns, indexing 3=25707
- normal equations, modifications, for non-linearity 3=23431
- parameter refinement procedure for simple structures 3=8834
- phase det. by heavy atom method 3=16067
- phase det. using zero pts. of Patterson function 3=16066
- phase determ. by non-crystallographic symmetry conditions 3=8831
- positions of two atoms showing "inverse overlap" 3=23434
- programming computers, U.S.S.R., survey 3=20831
- programming for electronic computation 3=13445
- scattering factor, imaginary part 3=3291
- secondary extinction, corrective formulae for polycrystal, applicability 3=8825
- shifts from super-symmetry positions, use of Patterson and Fourier functions 3=13444
- single-crystal transmission factors, prismatic crystals 3=25696
- single-crystal transmission factors, Weissenberg photographs 3=25697
- structure factors, phases 3=3292
- structure invariants, new relationships 3=25700
- structure refining, computer programme 3=23432
- U, anisotropic irradiation growth prediction 3=4898
- Weissenberg photographs, calc. of accurate lattice parameters 3=25699
- Wulff chart, errors 3=16061

structures

See Crystal structure, atomic.

technique

- binary alloys, liquid-like, scattering data interpretation 3=11282
- diffraction intensities, integral, meas. 3=20818
- diffraction prints, prep. of positives 3=13435
- epitaxial layers, face polarity, from diffr. 3=20827
- film powder method, for precision meas. of lattice parameters 3=8823-4
- indexing powder photographs, Lipson-Hesse difference method, most probable differences 3=20825
- instability, use of equi-inclination osc. photographs 3=11249
- intensity meas. with three-circle counter diffractometer 3=1282
- oriented mounting of crystalline spheres 3=25686
- plastics, crystallinity detm. 3=18290
- single crystal, inherent reflecting range determ. 3=25694
- single-crystal parameters, accurate meas. 3=13436
- space group determ. using anomalous dispersion 3=8826
- use of film as filter 3=8820

X-ray diffraction

- See also X-ray crystallography; X-ray scattering.
- anomalous dispersion for space group determ. 3=8826
- anthracene single crystals 3=20859-60
- apparatus for study of liquid structures 3=14704
- by atoms distrib. at random at lattice sites 3=25689
- cell, for liquid studies 3=7669
- crystal epitaxial layers, face polarity meas. 3=20827
- crystals, coherence region size and microstresses analysis 3=20704
- crystals, diffuse, optical analogue use 3=25698
- crystals with dislocations, Debye-Scherrer line profiles 3=25281

X-ray diffraction — contd

- crystals, streak pattern geometry, due to reciprocal walls 3=18297
- diffractometer, counter, specimen transparency effects 3=8817
- diffractometer, effect of working conditions 3=20816
- discovery and development of X-ray analysis 3=25682
- distorted crystals, dynamical diffraction, theory 3=13440-1
- dynamical theory, origin 3=3287
- Gauss and Cauchy profiles, distinction 3=16059
- gratings and echelletes for ultrasoft region 3=14705
- gratings, Pt and Au surfaces, grazing incidence 3=20943
- intensities on absolute scale 3=20823
- intensity correct. for beam ht., oriented specimens 3=8935
- line profiles study by photographic method 3=20817
- maxima, intensity distrib. 3=25688
- metal film layered structures 3=23437
- metals, interdiffusion study 3=2822
- oriented high-molecular substs. 3=13438
- pattern recording, point by point, fully automatic 3=25687
- peak, position and amplitude detm., errors, using scanning goniometer 3=19394
- perfect crystal, near total reflection 3=11253
- powder patterns, standard, 37 substances 3=18324
- proportional counter recorder 3=23427
- quartz, ground and shattered 3=3352
- renal, biliary concretions, composition 3=3647
- silicone rubber, diffrn. from lattice planes 3=3349
- single-crystal transmission factors, prismatic crystals 3=25696
- single-crystal transmission factors, Weissenberg photographs 3=25697
- steel, stress, lattice, residual, on plastic deform., meas. 3=18180
- textured specimens, relative intensities meas. 3=23526
- Ag, films and bulk metal 3=16062
- Al, broadening of lines after plastic deform. 3=20195
- Al, line intensities, temp. depend. 3=20864
- BeO, high temp. polymorph 3=1320
- Cr-Fe alloy, line intensities, temp. depend. 3=20864
- Cu, filed, line broadening due to stacking faults 3=20208
- Cu, transmitted and reflected intensities 3=20828
- Cu-Si-(Mn) alloys, pattern change rel. to deformation and annealing 3=22701
- Fe, α -phase, Debye temp. meas. 3=17662
- Fe, stress, lattice, residual, on plastic deform., meas. 3=18180
- Ge (111), asymmetrical Bragg case 3=5098
- NH₃, theory 3=8220
- NH₃-Ni cyanide complexes, powder patterns 3=1406
- NaN₃, deformed, stacking faults 3=8443
- Si plate, transmitted intensity, rel. to applied stress 3=23525
- Si, single crystals 3=5097
- ZnSb-CdSb, pseudo-binary system, structure 3=1348

X-ray examination of materials

- See also Chemical analysis, X-ray; Radiography.
- alkali halides, line broadening, and strain 3=8934
- amorphous, scatt., low angle, large incident beam 3=21446
- Berg-Barrett method, crystal surface study 3=25660
- carbides, sintered, micro-stresses 3=25619
- chromite-olivine system, Fe K α intensity rel. to Fe content 3=3421
- conference, Leningrad, June 1961 3=11243
- electron probe microanalysis, atomic no. effects 3=13630
- metals, interdiffusion study 3=2822
- microanalyser, development 3=3371
- microanalyser recording system 3=2035
- monocrystals, secondary extinction, correction 3=20824
- polyethylene, small-angle diffr. 3=5153
- quartz, radiation damage 3=8473
- solid solutions, cubic, elastic const. and phonon spectrum meas. 3=5054
- stresses, internal, reliability, steels, 0.01-1.25%C 3=13346
- textured specimens, relative intensities meas. 3=23526
- Ag-base alloys, stacking faults rel. to solute 3=2811
- AgCd, order-disorder transformations 3=3328
- BaTiO₃, grain size, effect on tetragonal to cubic transform. 3=8792
- BeO, irradiated, internal stresses 3=6550

X-ray examination of materials — contd

- CdS, crystal stacking faults, wurzite ribbon 3=15500
- Co powders, deformed, elastic anisotropy and lattice strain 3=1231
- GaAs, twin structures 3=13404
- Ge, dislocations in single crystal 3=6526
- KBr, line broadening, and strain 3=8934
- KCl-KBr, mixed crystals, diffusion formation 3=13004
- NaCl, line broadening, and strain 3=8934
- NaF, line broadening, and strain 3=8934
- PuC, 42-60 at.% C 3=10431
- Si-Ge layers, epitaxial, vapour grown 3=3281
- Cu-Ni powder compact, interdiffusion meas. 3=2823
- Th-Mo alloy 3=8896
- U, cold-rolling effects 3=8766
- U₃O₈, up to 1026° 3=15445
- liquids**
- benzene, compressibility study 3=21322
- cell, for liquid studies 3=7669
- diffraction Fourier analysis 3=18799
- diffractometer 3=14704
- ether, compressibility study 3=21322
- monatomic liquids 3=21304
- scattering, low angle, large incident beam 3=21446
- survey and bibliography 3=21303
- Ag, structure, by separating scatt. pattern contribs. 3=9438
- Au, structure, by separating scatt. pattern contribs. 3=9438
- Ga, liq., electron transport props. 3=1710
- Hg, structure, by separating scatt. pattern contribs. 3=9438
- microstructure**
- apparatus for use as microanalyser or shadow microscope 3=25786
- block size, from powder line profiles 3=8933
- camera, microbeam, for deformation studies 3=9893
- crystal, dislocations, diffr., resolution 3=17752
- crystal dislocations, review 3=22782
- crystallites, substructural characts., from interference spot dimensions 3=20942
- crystals with small distortion, dynamical theory of diffraction 3=13576
- dislocation meas. with oscill. film spectrograph 3=15490
- dislocations, image breadths, models 3=12979
- f.c.c. alloys, filings, heavy faulting, by diffr. 3=8418
- Fe, cast, steel, particle size and lattice distortion, by reflection 3=18401
- fibres in preferred orientations 3=18400
- graphite, pyrolytic, crystals, orientation 3=6820
- iron, carbonyl powders, changes on annealing 3=20873
- lattice distortion and particle size, by reflection 3=18401
- magnetic domain config. and movements 3=5011
- metals, mosaic block misorientation, and tensile strength 3=20728
- mosaic blocks, line-broadening rel. to secondary extinction 3=25784
- particle size and lattice distortion, by reflection 3=18401
- polymorphism, solids 3=11207
- quartz, vibrating, internal displacements, by diffr. 3=15982
- ruby, synthetic, Cr distribution 3=8808
- steel, case-hardened layer, phase substructure 3=1247
- steel, Fe, cast, particle size and lattice distortions, by reflection 3=18401
- Ag-Sb-Te, AgSbTe₂, phase formation 3=18345
- Al, after plastic deformation 3=20195
- Al-Cu, apparatus 3=25786
- Cr crystalline texture of hard deposits 3=25782
- Cu, filed, diffr. line broadening due to stacking faults 3=20208
- CuAl₃, plastic deformation, up to m.p. 3=20718
- FeO, phase transformations 3=11200
- Ga-Sb-Te system 3=25732
- Ge, anomalous transmission, rel. to dislocation density 3=20196
- Ge, apparatus 3=25786
- Ge- α -Fe solid solution 3=3340
- Ge-Ni solid solutions, supersat., decomposition, microvoids 3=23486
- Mo-35 at.%Re, crystal twinning, on deformation 3=23380
- NaNO₂, ferroelec. phase transition 3=25405
- PbTe, cold worked and annealed 3=18203

X-ray examination of materials — contd**microstructure — contd**

- Si, epitaxially grown, defects study 3=25286
W, particle size of deformed 3=25785

molecular structure

- Cu, line widths and crystal dislocations 3=20946
Nb oxides, formation, on heating Nb films
and powder 3=13458
S—P₄S₁₀ amorphous solid solutions, effect of P on S chain
stabilization 3=20916

X-ray measurement

- See also Dosimetry.
absorption in powders, appar. 3=12281
camera construction, for small angle scatt. 3=2072
counter, proportional, Ar—CH₄, resolving time,
10 keV 3=22103
electron multiplier for 0.1–3 MeV 3=4373
fluorescence analysis, meas. technique 3=13633
interference, with counter goniometer, recorder inertia
influence 3=19394
ionization chamber, calorimetric calibr. 3=2151
ionization chamber, capacitor-type, for pulsed
X-rays 3=24420
isodose automatic plotter 3=19391
proportional counters with pulse-height analyser for
Cu K α meas. 3=24421
radiography of radioactive specimens 3=7668
Sceptre, electron flux X-ray film, calibration 3=2068

X-ray microscopes

See Microscopes.

X-ray monochromators

- double-crystal unit, description and use 3=4231
Johansson unit, choice of parameters 3=2070
precision-type 3=17013
prochlorite (natural silicate) as diffraction crystals 3=4230
theory, use 3=2069

X-ray reflection

- asymmetric surface effect, anomalous 3=25685
bent crystals, hard rays, rel. to line shape 3=6835
crystal diffraction, amplitude atten. 3=13437
crystal surfaces, texture study 3=25660
crystals, anomalous extinction effects 3=8828
crystals, dislocations, intensity calc. 3=5063
from fibres in preferred orientations 3=18400
glass and titanated surfaces, ultrasoft X-rays 3=14706
glass (BK7), 1.54 Å 3=23093
perfect crystal, near total reflection 3=11253
solid solutions, effect of thermal oscillations 3=3339
Al films, 1.54 Å, 500–3000 Å thick 3=23093
Cu crystals, rel. to transmission 3=20828
Ge, dislocations, intensity calc. 3=5063
Ge, (220) and (111) planes, meas. 3=1318
Mn ferrite, line width variations 3=3304
Mo filings, Fourier anal. and line breadths 3=16068

X-ray scattering

- See also Compton effect; X-ray diffraction.
by atoms, sum rules, involving screening const., self-
energy 3=12775
Bravais lattice, Debye—Waller factor, anharmonic
contris. 3=8827
characteristic modified scatt. by Li, Li₂O, LiF,
Be, B 3=5982
gases, low angle, large incident beam 3=21446
lattice vibrations, theory and expt., review 3=22634
liquids, low angle, large incident beam 3=21446
measurement, small angle, standards 3=19393
particle system, small-angle, rel. to size
distrib. 3=18402
particle with arbitrary mag. moment, relativistic
presentation 3=23749
polymers and macroisotropic systems 3=16088
screw dislocations, displacement field 3=2806
small angle, camera construction 3=2072
solid solution, by thermal vibr., theory 3=11250
solid solns., small-angle, Guinier—Preston zones 3=8878
solids and powders, diffuse scatt. 3=11251
solids, low angle, large incident beam 3=21446
in water phantom, meas. and calc. 3=7062
from Al, low angle 3=2072
from Cu, low angle 3=2072

X-ray scattering — contd

- Fe₂N, atomic factor of N 3=8846
Ge, atomic scatt. factor, imag. part 3=11257
He atom, atomic scatt. factors calc. 3=25703
He atom, Schwartz method calc. 3=10445
Hg, liquid, temp. depend. 3=7198
Mg—In h.c.p. alloy, local order obs. 3=25744
by N₂, mol. wave-function 3=19985
Si, crystal lattice optical and acoustic oscill. frequ.
293°K 3=15419
ZnS, faulting effects 3=17771

X-ray spectra

- See also Atmospheric spectra; Chemical analysis, X-ray.
atomic number and K-absorpt. edge energy 3=25470
atoms in cpds., chemical bond effects 3=6658
Auger, in j—j coupling, calc. 3=17524
auroral zone, pulsating, 100 second period
range 3=11455
cathode massive, yield by measuring photoeffect 3=6663
crystals, fluorescent, rel. to atomic site electric field
meas. 3=10972
K β , line relative intensity, in different metal compounds,
by superposing short-wave tails of K β , 3=23085
K—LL Auger spectrum, empirical Z-depend. 3=2591
metals, K-series, rel. to pre-excitation of interacting
electrons 3=25471
non-diagram lines 3=23084
plasma, theta-pinch, Scylla I, 15–25 Å 3=24296
rare earth hexaborides, analysis 3=10763
satellites, origin, survey 3=10442–3
satellites, theory, two-electron transition 3=23091
Z = 38–47, K—LL Auger spectrum, in intermediate
coupling region 3=2592
Au, new L transition, non-quadrupole 3=8183
Cr, K-absorption 3=3030
Cs, fast neutron capture 3=6267
CuK α , line shift from Cu to CuO 3=20499
Cu thin foils, fine structure "melting" rel. to atomic
thermal vibrations 3=10973
Cu—Pt solid solution thin foils, fine structure "melting"
rel. to atomic thermal vibrations 3=10973
Fe group, asymmetry in K α , and K α , lines,
cause 3=8184
Fe, K-absorption 3=3030
Fe transition group metals, K α , and satellites, temp.,
crystal var. 3=25475
Ga, M-bands 3=9593
..I¹³⁵, K—LL Auger spectra, satellites 3=4707
Mo, short wavelength limit meas. 3=4979
Nb, short wavelength limit meas. 3=4979
Pb, L-spectra, quadrupole and forbidden
transitions 3=4712
Pt thin foils, fine structure "melting" rel. to atomic
thermal vibrations 3=10973
Re, L-spectra, quadrupole and forbidden transitions 3=4712
Re¹⁶, L-emission, quadrupole and forbidden lines 3=15293
S cpds, K α transition, rel. to outer shell 3=19997
Ta, short wavelength limit meas. 3=4979
..Te¹³⁵, K—LL Auger spectra, satellites 3=4707
W, L-spectra, quadrupole and forbidden transitions 3=4712
W, short wavelength limit meas. 3=4979

absorption

- fine structure, temp. depend., theory 3=4977
inert gases, L 3=8189
krypton, L 3=8189
semiconductors, short wave limit displacement 3=4919
solids, fine structure, short-range order theory 3=6657
transition metal cpds., covalent complexes, fine
structures 3=8609
transition metal compounds, K-absorption edge
splitting 3=25175
ultrasoft bremsstrahlung region 3=4232
xenon, L 3=8189
Ag, L-absorption, fine structure, theory 3=6661
Al alloys and compounds, K 3=10974
Be, ultrasoft region 3=4232
Ca compounds, influence of charge on Ca ion 3=8273
Ca compounds, X-ray K absorption, influence of charge
on Ca ion 3=8273
CdTe, L-absorpt. 3=25472
CsCl, K-absorpt. of Cl, meas. 3=6660

X-ray spectra — contd**absorption — contd**

- CsClO₄, K-absorption of Cl 3=20498
 Cu, K absorpt. edge region, photoelec. emission 3=6351
 Cu—Zn cpds, K-edge fine structure 3=5134
 Fe, K absorpt. edge for β, γ, δ iron 3=15691
 Fe, K-spectrum, fine structure, effect of W impurities 3=8608
 Fe silicides, K β , line, shift rel. to Fe 3=20041
 Fe—Mo solid solutions, fine structure rel. to binding forces 3=5141
 Ge, K-absorption, extended line structure, rel. to polarization 3=20500
 Ge, K-absorption, fine structure and theory 3=6659
 K halides, K-absorpt of K 3=6662
 KCl, K-absorpt. of Cl, meas. 3=6660
 KCl, K-absorption of K and Cl 3=20497
 KClO₃, K-absorpt. of Cl 3=23090
 KClO₃, K-absorpt. of K and Cl 3=20497
 KClO₄, K-absorpt. of K and Cl 3=20497
 KClO₄, K-absorption of Cl 3=20498
 K—LL Auger lines, intensities, rel. to atomic number 3=17523
 LaF₃, Nd³⁺ doped, hidden selection rule 3=20481
 LiCl, K-absorpt. of Cl, meas. 3=6660
 3LiClO₃·H₂O, K-absorpt. of Cl 3=23090
 LiClO₄·3H₂O, K-absorption of Cl 3=20498
 NaCl, K-absorpt. of Cl, meas. 3=6660
 NaClO₃, K-absorpt. of Cl 3=23090
 NaClO₄·H₂O, K-absorpt. of Cl 3=20498
 Nb, L_{III}, L_{II} edges 3=23095
 Ni—Mo solid solutions, fine structure rel. to binding forces 3=5141
 Pd, L-spectra 3=4710
 Pu, M 3=8610
 RbCl, K-absorpt. of Cl, meas. 3=6660
 RbClO₃, K-absorpt. of Cl 3=23090
 RbClO₄, K-absorption of Cl 3=20498
 S in covalent gaseous SO₂, SOCl₂, SO₂Cl₂, ionic gaseous H₂S and crystalline CaSO₄, K spectrum 3=23097
 Si, anomalous transmission, 500–1540 XU 3=13185

emission

- correction of distorted spectra, two methods 3=4238
 crvstals, soft bands, rel. to Fermi level 3=4838
 cubic diamond-type lattice, derivation by band structure theory 3=10618
 distortion, due to reabsorption, in layer thickness 3=6898
 heavy elements, L intensities, 50 kV electron excitation 3=8178
 K α satellites, interference with tail of K α , line 3=23426
 K X-ray yields, low atomic no. elements 3=23089
 linewidths, true values from meas. values 3=3029
 M-bands, Cu and Ni, from Cu—Ni system 3=23087
 metals, characteristic X-rays, comp. of theory and expt. 3=13193
 moon, calc., and composition 3=13860
 self-absorption corrections, due to line and continuum 3=23094
 sun, 4–14A, UK1 satellite results 3=16388
 X-ray emission, observations and theory 3=13894-5
 Al alloys and compounds, K β _x 3=10974
 Al, liquid, L₂₃, rel. to structure 3=16628
 Al, plasmon satellites 3=8607
 Al XII impurity in high-temp. deuterium plasma 3=7581
 Be, valence band 3=8606
 Cr, 3d electrons config. in metal 3=4833
 Cr cpds., K β ₁ β ¹ line, effect of chemical bond 3=23086
 Cu, M-bands from Cu—Ni system 3=23087
 Cu, M-series 3=23088
 Cu, ratio of intensity of K α to white radiation, 30 kV 3=25473
 Cu—Zn, M-series 3=23088
 Fe K β _s 3=10976
 Fe, 3d electrons config. in metal 3=4833
 Fe—Co alloy, soft M₂₃ 3=25476
 Ir, L-spectrum, forbidden transitions 3=2566
 Ir⁷⁷, L, quadrupole and forbidden lines 3=12762
 Li, valence band 3=8606
 Mg XI impurity in high-temp. deuterium plasma 3=7581
 Mg, plasmon satellites 3=8607

X-ray spectra — contd**emission — contd**

- Mg, valence band 3=8606
 Na, plasmon satellites 3=8607
 Na, valence band 3=8606
 Na X impurity in high-temp. deuterium plasma 3=7581
 Nb, soft bands, rel. to Fermi level 3=4838
 Nb, L β ₂ band, correction 3=4978
 Nb, L_{III}, L_{II} absorpt. edges 3=23095
 Nb—N cpds., L β ₂ band, correction 3=4978
 Ni, M-bands from Cu—Ni system 3=23087
 S in PbS, L₂₃ 3=23096
 Si XIII impurity in high-temp. deuterium plasma 3=7581
 Ta⁷³, L, quadrupole and forbidden lines 3=12766
 Th⁹⁰, L-spectrum 3=8192
 Ti compounds, bond type and K β _s line changes 3=23092
 Tm¹⁶⁸, K α line, isomeric shift 3=12640
 U oxides, M γ last lines, and oxidation degree, valency 3=23558
 U²³⁵, during thermal fission 3=10394
 W, K and L α , lines, true widths 3=3029
 Zn, M-series 3=23088

X-ray spectrometers

- See also Gamma-ray spectrometers; X-ray crystallography, apparatus.
 beryl, single-crystal, diffraction, for deuterium plasma in Scylla 3=7581
 curved-crystal fluorescence spectrograph 3=461
 high-resolution, operating in range 1.8–4.5A 3=8610
 Johann-type microfocuss spectrometer 3=4233
 many-crystal, exact adjustment of crystals 3=2071
 microanalyser, electron probe, with 90 deg. take-off angle 3=4237
 prochlorite (natural silicate) as diffraction crystals 3=4230
 proportional counters with pulse-height analyser for Cu K α meas. 3=24421
 resolution of Johann mounting single-crystal type 3=4236
 for solar obs. from satellite 3=9152
 spectra shape correction circuit 3=5601
 two-crystals and spectrometers, for fine structure 3=17012
 with 2m arm 3=21919
 ultrasoft, with two forms of detection 3=9895
 vacuum-type, high resolution 3=4234
 Si as focussing analyser crystal, for fine structure 3=21920

X-ray spectroscopy

- See also X-ray crystallography; X-ray diffraction.
 camera, low temp. 3=21921
 chromite—olivine system, Fe K α intensity rel. to Fe content 3=3421
 conference, Kharkov, 1961 3=3028
 correction for symm. distortion 3=7670
 correction of spectral profiles, derivative method 3=7323
 correction of spectral profiles for dispersion 3=7324
 fluorescence spectroscopy, review 3=16185
 layered structures for sharp X-ray diffr. 3=23437
 long wavelength, use in microanalysis 3=18467
 plasma, high-temp., interpretation 3=7503
 use of potassium acid phthalate crystal 3=24296
 secondary-emission multipliers, choice 3=5802
 soft (13–44A) emission spectroscopy 3=463
 two concave gratings at grazing incidence, useful width 3=21565
 windowless tube, for increased intensity 3=14703

X-ray tubes

- coaxial flash tube, discharge mechanism 3=9894
 Cu target, ratio of K α to white radiation 3=25473
 current stabilizer 3=9701
 5 kW, for attachment to X-ray spectrometer 3=4235
 microanalyser, electron probe with 90 deg. take-off angle 3=4237
 microanalyser, microfocuss source investig. 3=5801
 parasitic radiations 3=9896
 radiation protection installation 3=462
 rotating anode of Re—W 3=17014
 rotating target, maximum safe loading 3=21918
 secondary, built-in, for K-emission excitation 3=14702
 spectral contamination, sealed-off tubes 3=17011
 ultrahigh-speed flash, review 3=21579
 windowless, for spectroscopy, increased intensity 3=14703

X-rays

See also Gamma-rays.

- absorption, in layer thickness, effect on emission spectrum 3=6898
- atmosphere, var., long period, and auroral electron precipitation 3=23631
- atmospheric, intensity increase rel. to magnetic storm sudden commencement 3=11471
- auroral zone observations, rel. to electron precipitation varn. with solar activity 3=1471
- auroral zone pulsations, 1 to 15 sec period 3=13813
- camera, Fresnel transformation method 3=16742
- cosmic rays, primary, possible prod. mechanisms 3=22232
- detection, by exo-electron emission 3=12229
- equipment, many-crystal, exact adjustment 3=2071
- metrology, ionometric methods 3=21279
- moon, emission, calc., and composition 3=13860
- μ -mesic, $2p-1s$, calculated energies, correction 3=8217
- outside solar system 3=18588
- production in Au films, rel. to electron and X-ray microscopy 3=6903
- production in metal films, efficiency, rel. to X-ray microscopy 3=6902
- solar, rel. to ionospheric D-region disturb. 3=6981
- sources outside solar system 3=7941
- theta pinch discharge before breakdown 3=12179

effects

See also Nuclear reactions due to photons.

- air, weak ionization, electron cond. 3=3839
- alkali halides, α - and γ - band formation 3=22835
- alkali halides and azides, crystallite growth on cleavage planes 3=20254
- alkali halides, M-centres, X-ray generation 3=22845
- alkali halides, thermoluminescence 3=3073
- aqueous soln., yield of e and H atoms 3=3410
- chemical, non-metallic crystals 3=8975
- elements, light, X-ray fluoresc. meas. 3=3033
- exo-electron emission, as detection method 3=12229
- glasses, photosensitive, colouring 3=8478
- glycine, e.s.r., h.f.s. 3=18132
- inert gases, luminescence 3=21448
- inert gases, luminescence, increase due to electric field, pulsed 3=16664
- luminescence, gases, increase due to electric field, pulsed 3=16664
- luminescence, ZnS:Mn, ZnCdS:Mn, a.c. components prod. by 10^4 V/cm at 400 c/s 3=15710
- metal cathodes, photoelectric, secondary emission effects 3=19310
- perovskite ferroelectrics, excitation of anomalous layers 3=22993
- phosphor NE 102, fluorescent yield for 4-17 keV X-rays 3=25494
- phosphors, de-excitation of luminescence 3=13197
- photoelectric emission, 0.7-30 keV 3=14638
- photoelectric emission, cathodes, dielectric 3=19311
- photographic materials, quantum sensitivity 3=3902
- polyethylene, diffusion recombination 3=20379
- quartz, annealing of damage 3=6555
- α -quartz, with Ge impurities, colour centres, e.s.r. study 3=22832
- transition elements, fluorescence excitation 3=953
- triglycine sulphate, thermal expansion 3=6481
- Ag photoelectric emission, from films, effective depth, 0.28-9 keV 3=21864
- Ag, photoelectric emission, 0.7-30 keV 3=14638
- AgCl, luminescence meas. 3=6671
- Al, photoelectric emission 0.7-30 keV 3=14638
- on Ar, subjected to reson. press. vars., pot. prod. 3=7449
- Au photoelectric emission, from films, effective depth, 0.28-9 keV 3=21864
- BaTiO₃, thermoluminescence, dielec. loss 3=968
- Be photoelectric emission, from films, effective depth, 0.28-9 keV 3=21864
- CaF₂, Y-doped, coloration spectrum 3=8593
- CaWO₄, luminescence, wavelength depend. 3=4982
- CdS, photoelectricity, 15°, -176°C 3=20405
- Cr, photoelec. emission, rel. to X-ray polarization 3=14630
- CsF, absorption spectrum, 295, 80, 18°K 3=15676
- Cu, photoelectric emission, 0.7-30 keV 3=14638

X-rays — contd

effects — contd

- Ge photoelectric emission, from films, effective depth, 0.28-9 keV 3=21864
- α -HgS, enhancement of elec. cond. 3=6600
- I crystals, thermoluminescence 3=6653
- KBr, coloration near fundamental edge 3=15517
- KCl: Ag, trapped holes and electrons 3=5044
- KCl, colour centres, rel. to intensity 3=25297
- KCl, coloration near fundamental edge 3=15517
- KCl, divalent-doped, Z, centres, growth and bleaching 3=22846
- KCl, F-centres and strain, rel. to intensity 3=6545
- KCl, imperfections 3=22708
- KCl photoelectric emission, from films, effective depth, 0.28-9 keV 3=21864
- KI, loops and screws due to "white" Cu X-rays 3=13024
- KI: Tl, luminescence, wavelength depend. 3=4982
- Kr, luminescence, increase due to electric field, pulsed 3=16664
- LiF, coloration, rel. to growth method 3=25298
- LiF:Co, optical props. and electron emission 3=8598
- LiF, dielec. props. and thermoluminescence 3=8479
- LiF, spectra, absorpt., sharp lines 3=23073
- MgO, slip bands and microhardness 3=17761
- NaCl, colour centres, rel. to intensity 3=25297
- NaCl, dielec. props. and thermoluminescence 3=8479
- NaCl, F-centre formation 3=13011
- NaCl, F-centres at dislocations 3=15518
- NaCl, F colour centre formation 3=22844
- NaCl, photoconductivity 3=4955
- NaCl:Pb, activator absorpt. spectrum 3=940
- NaCl, stored energy meas. rel. to F-centre concn. 3=2839
- NaCl-type crystals, defects 3=20185
- NaI:Tl, luminescence, temp. and Tl conc. depend. 3=23107
- NaN₃, fine structure of trapped N atoms, e.s.r. 3=25574
- O₂, weak ionization, electron cond. 3=3839
- Pb, secondary electrons, irradi. at 320 kV 3=12241
- Pt, photoelectric emission, 0.7-30 keV 3=14638
- Si, p-n, electron-vacancy pair formation energy 3=20165
- SiO₂, vitreous dilatations and internal stresses 3=4899
- SrF₂, Y-doped, coloration spectrum 3=8593
- Tl, photoelec. emission, rel. to X-ray polarization 3=14630
- Tl azide, particle size changes and lattice expansion 3=22873
- U, irradiation-growth after mechanical working 3=8480
- Xe, luminescence, increase due to electric field, pulsed 3=16664
- (Zn, Cd)S: Cu phosphors, crystal structure, atomic 3=23457
- ZnCdS:Mn, luminescence, a.c. components prod. by 10^4 V/cm at 400 c/s 3=15710
- ZnS:Mn, luminescence, a.c. components prod. by 10^4 V/cm at 400 c/s 3=15710

protection

See Radiation protection.

Xenon

- absorption coefficients, 600-1025 Å 3=25056
- adsorption in graphite, 2nd and 3rd virial coeff. 3=5150
- adsorption on W, rel. to surface features 3=3369
- arc, elec., low-pres., optical radiation phenom. 3=4078
- arc, electric, 2 atm., radiative function 3=14555
- arcs, magnetic contraction, at medium current intensities 3=7486
- atom, interaction, potential energy curve 3=8212
- atom, scatt. by Li, interact. potential eval. 3=15305
- atoms, electron scattering, elastic and inelastic, 25 keV 3=22495
- atoms, excitation, by Kr, in discharge, by collisions 3=19190
- atoms, ionization by colls. with Neⁿ⁺ 3=7426
- boiling and triple points, detm. 3=9659
- continuous spectra, behind shock wave 3=14218
- dense gas, polarizability change due to many-body interact. 3=1705
- diffusion factor, thermal, trennschaukel meas. 3=11822
- diffusion in Cs-halides, after n irradi. 3=15508
- diffusion in He, thermal, calc. 3=7233
- diffusion in UC powder 3=2834

Xenon — contd

- discharge, glow, anomalous, charge-exchange 3=19219
 discharge, high-pressure, radial temp. and mobility 3=19192
 discharge, vacuum u.v. spectra 3=7462
 elec. discharge, Xe-N₂-Ba, metastable state of N₂ 3=2618-19
 elec. discharges, effect of H and He admixture 3=4045
 elec. discharges, repetitive, spark channel explosions 3=1950
 electric arc, high-pressure, voltage-current charact 3=24262
 electron momentum-transfer collision frequ. in He mixtures 3=24220
 gas discharge flash tube, for masers, optical, ruby, design 3=19217
 gas, ionized, rarefied, charge-carrier diffusion 3=16906
 glow, admixture rel. to Ne reference tube 3=4054
 ion beam, range in metals from sputtering yield 3=5721
 ion beams, multiply-charged, in isotope separator 3=14669
 ionization by h.f. pulse, recombination 3=4024
 ionization potential by photoelectron energy spectra 3=7434
 ions, range in W, keV energies 3=22878
 ions (133), range in Al, 0.5-240 keV 3=19372
 ions, Xe¹³³, range in Al and Au 3=12608
 light source lamps, spectra, 230-1200 mμ, effect of structure and excitation 3=16760
 liquid, neg. ion mobility in 3=1678
 luminescence, α-ray excited, weak, 2400-5000 Å 3=21447
 luminescence, X-ray excited, increase due to electric field, pulsed 3=16664
 maser, optical 3=17074
 maser, optical, effect of He on electron temp. and density 3=17091
 maser, optical, i.r., 2.5-13μ, new freq. possibilities 3=17075
 maser, optical, 3.5 μ 3=24516
 n.m.r. of Xe¹²⁹, chemical shift 3=16667
 n.m.r. of Xe¹²⁹ in liq. and gas 3=16666
 photo-ionization efficiency curves, 9-14 eV 3=24211
 plasma in anode-glow mode, neg. resistance 3=5635
 plasma, cold, negative radiation temperature 3=9787
 plasma, r.f., stationary and running striations 3=4165
 plasma, radiation temperature resonances, r.f. meas. 3=4121
 poisoning in high-flux reactors, calc. 3=4696
 population inversion in discharge, Doppler broadening 3=22493
 powerful impulsive discharges, electron energy meas. 3=7452
 saturated vapour pressure difference for Xe¹³⁰,¹³⁶ 3=21633
 scattering of Li and K atoms, velocity depend. of cross-section 3=711
 solid, density and thermal expansion 3=6480
 solid and liq., n.m.r. of Xe¹²⁹ 3=18154
 solid, u.v. absorpt. and electron states 3=2998
 spectrum, continuous absorpt., energy levels 3=17535
 spectrum, continuous, vacuum u.v. 3=7246
 thermal ionization, kinetics 3=14515
 triton range, 0.2-2.7 MeV 3=10180
 X-ray spectra, L-absorption 3=8189
 Xe-He, maser, optical, very high gain, 3.5 μ 3=17089
 Xe⁺ sputtering of Cu, Ni, Fe, Mo, 100-1000 eV 3=4216
 Xe³⁺, ⁴⁺ ions in Ne, charge exchange 3=5630
 Xe¹²⁹ in atmosphere, rel. to solar system chronology 3=9165
 Xe¹²⁹/Xe¹³² in meteorite Bruderheim chondrules 3=11524
 Xe¹²⁹/Xe¹³⁶ formation interval, rel. to solar system chronology 3=9166
 Xe¹²⁹,¹³¹, n.m.r. relaxation time rel. to gas density 3=23944
 Xeⁿ⁺-Ne; and Xe-Neⁿ⁺ collisions; ionization 3=2583

Xenon compounds

- fluorides, bonding wavefunctions 3=17589
 Xe-hydrocarbon ions, formation from nuclear decay 3=16183
 XeF, radical, in *r*-irradiated XeF₄, e.s.r. spectrum 3=25136
 XeF₂, crystal and molec. structr. 3=16073-4
 XeF₂, molec. electronic structure 3=15356
 XeF₂, n.m.r., chemical shifts 3=17617
 XeF₃, XeF₄, binding mechanism 3=15357

Xenon compounds — contd

- XeF₂, XeF₄, bond nature 3=20000
 XeF₂, XeF₄, mol. structure, calc. 3=15355
 XeF₄, crystal and molec. structr. 3=16073, 16075
 XeF₄, crystal structure 3=6846
 XeF₄, crystal structure, atomic, monoclinic phase 3=23452
 XeF₄, molec. electronic structure 3=15356
 XeF₄, n.m.r., chem. shifts and nuclear coupling 3=17617
 XeF₄, nuc. mag. res. of F¹⁹ 3=12868
 XeF₄, structure 3=12844
 XeF₄, F¹⁹ n.m.r. spectrum 3=15387
 XeF₆, n.m.r., chemical shifts 3=17617
 Xe¹²⁹F₂, Xe¹²⁹F₄, Na₄Xe¹²⁹O₈·H₂O, hydroquinone clathrate, Mössbauer effect, 4.2°K 3=17634
 XeOF₄, n.m.r. of Xe¹²⁹, by second r.f. appln. 3=20016
 XeOF₄, n.m.r., chem. shifts and nuclear coupling 3=17617
 XeOF₄, spectra and melting point 3=17590

Ytterbium

- atom, self-consistent wave functions 3=8197
 atoms, spectra, h.f.s. 3=2364
 elec. resistance, effect of temp. and press. 3=13038
 isotopes, masses meas. 3=4727
 laser action of ions in silicate glass, simultaneous with Nd ions 3=7737
 semiconducting region at 20-40 kbars 3=17899
 specific heat, 0.4-4°K, meas. and theory 3=8368
 transition from f.c.c. to b.c.c. 3=6817
 virtual bound state model for high-pressure resist. 3=2756
 Yb³⁺, electron structure, free and in cryst. field 3=8379
 Yb³⁺ e.s.r. in CaF₂ 3=3172
 Yb³⁺ in CdF₂, spin-lattice relax., 2-77°K 3=18138
 Yb³⁺ in soln., near i.r. transitions 3=23885

Ytterbium compounds

- YbAl₂, mag. moment and Curie pt. 3=991
 YbC₂, neutron diffract. and paramag. scatt. analyses 3=1328
 YbFe garnet, exchange fields 3=1159
 YbFe garnet, ferrimagnetic resonance in far i.r. 3=15930
 Yb₂O₃, crystals, flame fusion growth 3=8805
 Yb₂O₃, specific heat and thermodyn. props. 3=20105
 Yb₂O₃, thin films, dielectric constant 3=8555
 Yb₂(SO₄)₃·8H₂O, susceptibilities, magnetic, principal, crystal field nature 3=25510

Yttrium

- atom, Y⁹¹, h.f.s. 3=2361
 diffusion, in Y₂O₃, 1400-1800°C 3=22827
 positron mean life, meas. 3=17695
 solubility in Be, X-ray diffract. study 3=20908
 Y⁸⁹ on high activity Zr⁹⁵ fallout particles 3=12612
 Yb³⁺ in Y₂O₃, e.s.r. 3=18135

Yttrium compounds

- borides, electron requirements 3=8330
 ethylsulphate, thermal study of crystal field splitting 3=4799
 ferrite garnet, etching 3=18240
 ferrites, initial permeability, var. with freq., temp., garnet struct. 3=6723
 garnet, gyromagnetic resonance, effect of method of prep. 3=8699
 (1-x){Y₁}Fe₂O₁₂ - x[Ca²⁺][Fe₂](Si₂⁴⁺)O₁₂, ferromag. props. 3=5025
 (1-x){Y₁}Fe₂O₁₂ - x[YCa²⁺][Fe₂](Fe₂V⁵⁺)O₁₂, ferromag. props. 3=5025
 Y ferrites, hydrothermal synthesis 3=18272
 Y garnet with rare-earth impurities, resonance line width 3=25558
 Y tungstate, red luminescence under u.v. excitation 3=13206
 YAl garnet, Pr-doped, absorption and fluorescence spectra, Pr bond covalence 3=23072
 YC₂, neutron diffract. and paramag. scatt. analyses 3=1328
 YCO₃, ferromagnetic, props. room temp. and below 3=15731
 YCo₅, mag. structure 3=8682
 Y-Eu mixed garnets, mag. props. 3=3124
 YFe ferrite, ferromag. resonance 3=6738
 YFe ferrite, rotational magnetization reversal 3=15873

Yttrium compounds — contd

- YFe garnet, crystal field calc. for 3 sites 3=2693
 YFe garnet, crystal structure, refinement 3=8834
 YFe garnet, ferrimagnetic resonance, rare-earth doped, theory 3=23216
 YFe garnet, Fe^{3+} relaxation 3=23252
 YFe garnet, ferro-acoustic resonance 3=11129
 YFe garnet, ferromag. reson. 3=3154
 YFe garnet, ferromagnetic resonance rel. to induced anisotropy 3=8702
 YFe garnet, heat transport by spin waves 3=8374
 YFe garnet, hyperfine Zeeman splitting, 85° and 300°K 3=994
 YFe garnet, magnetoelastic interactions in parallel pumping 3=15884
 YFe garnet, magnetostrict., meas. and theory 3=15901
 YFe garnet magnetostriction 3=15852
 YFe garnet, microwave absorption in parallel-pumping expts. 3=15883
 YFe garnet, multiple magnon processes 3=18122
 YFe garnet, n.m.r. freq., anisotropy 3=3205
 YFe garnet, Nd-substituted, ferrimagnetic properties 3=25546
 YFe garnet, optical interaction, at ferrimagnetic resonance 3=6644
 YFe garnet, phase transform., by differential thermal anal. 3=8796
 YFe garnet, rare-earth substituted, ferrimag. res. rel. to temp. 3=23215
 YFe garnet, relax., near instability threshold 3=3157
 YFe garnet, single crystal, saturation magnetostriction 3=15888
 YFe garnet, spin-wave growth under parallel pumping 3=15899
 YFe garnet, spin-wave propag. and magnetoelastic interaction 3=15889
 YFe garnet, spin-wave spectrum anisotropy 3=23209
 YFe garnet square hysteresis loops 3=15868
 YFe garnet, substitution of Mn^{2+} , Fe^{2+} and Ni^{2+} 3=3129
 YFe garnet, 2-magnon scatt. processes 3=15916
 YFe garnet, use in u.h.f. delay line 3=14778
 YFe garnets, ferromag. reson. line widths, temp. and freq. depend. 3=23210
 YFe garnets, magnetization and resonance props. 3=6721
 YFe garnets, spin wave linewidth, rel. to subsidiary resonance suppression 3=18119
 YFeAl ferrite, ferrimagnetic resonance 3=6743
 $Y_2Fe_2O_7$, crystal growth 3=20801
 $Y_3Fe_5O_{12}$, neutron diff. exam., mag. structure 3=23186
 $YFeO_3$, magnetic domains by Kerr effect 3=18103
 $YFeO_3$, remanent mag., field depend. 3=11063
 YFe oxide mixtures, phase transform., by differential thermal anal. 3=8796
 YGa garnet, absorpt. spectrum of Er^{3+} 3=13172
 YGa garnet, Dy^{3+} e.s.r. lines 3=15937
 $Y(Gd)Cl_3 \cdot 6H_2O$, u.v. absorpt. spectrum 3=10945
 YH, and YD₃, heat capacity, thermodynamic functions, and i.r. spectra 3=17658
 YI garnet, remanent mag., field depend. 3=11063
 YI₃, crystal structure 3=25714
 $Y_xIn_{1-x}Fe_{1-x}O_3$, (x < 0.5), preparation and ferrimag. resonance 3=20800
 Y—Lu, elec. cond. and mag. phenomena 3=13033
 YNd garnet, neutron diffraction investigation 3=23183
 YNi₂, magnetic props. of Laves phase 3=15746
 YO, B Σ term, multiplet splitting 3=6388
 Y_2O_3 crystals, flame fusion growth 3=8805
 Y_2O_3 , electron emission, secondary, with thermal emission current 3=24343
 Y_2O_3 , Y diffusion in, 1400–1800°C 3=22827
 YP, crystal structure 3=11258
 YSi, crystal structure, rel. to similar types 3=18338

Zeeman effect

- a.c. field, normal, calc. 3=22473
 crystal exciton spectra 3=22689
 cubic crystals Γ_1 level 3=15689

Zeeman effect — contd

- galactic 21 cm line, splitting, measurement attempt 3=13927
 maser, optical, tuning, He—Xe, 2.026 μ 3=17076
 relative line intensity, dipole transition, free atom, $J = \frac{1}{2}$ 3=17520
 sunspots, mag. field, intensity and orientation 3=18628
 $CaF_2:Eu^{++}$ (0.01%) crystal, 4.2°K, 4130 Å 3=17983
 $CaF_2:Sm^{2+}$, in absorption and luminescence spectra 3=18026
 $CaF_2(Eu^{2+})$, 17 to 60 kG 3=10943
 Ca I, 4s4p³P₁ term, g_J factor meas. 3=2564
 Cd¹⁰⁰, (5s5p)³P₁ state 3=19931
 Cl₂, solid, n.q.r. line broadening 3=15411
 Cl³⁵ in (PNCI₄), nuclear quadrupole resonance 3=23264
 CoCs₂Cl₆, 20–1.6°K, 15–40 kG 3=13166
 Cr₂O₃, R absorption lines 3=15674
 Cs, 600–3000 G 3=17520
 Cu₂O, crystal excitons, polarization, up to 140 kOe 3=18002
 GaP, bound excitons, recomb. radiation 3=25254
 He—Ne planar laser 3=2145
 HgI and II spectra 3=15286
 Lu I spectrum 3=22481
 NH₃, obs. using maser spectrometer 3=12354
 SmCl₃, absorption and fluorescence spectra 3=3016
 SrF₂:Sm²⁺, in absorption and luminescence spectra 3=18026

Zeta-potential

See Electrokinetic effects.

Zinc

- As content detm. by radiochemistry 3=1399
 atom, μ -mesonic, X-ray transition energies 3=6370
 atoms, mesic, μ^- decay anomaly 3=15312
 atomic spectral line (6362Å) narrowing 3=5465
 coating on Cu, bonding phase structure 3=5146
 coating on steel, bonding phase structure 3=5146
 condensation in vacuum and props. of condensate 3=18036
 cracks, development in presence of Ga and Hg 3=20757
 creep, polycrystalline, anomalous activating energy 3=18190
 creep, pressure depend. 3=25630
 crystal, cleaved pits, spirally terraced, etching obs. 3=22787
 crystal growth, large single, for neutron monochromatization 3=23403
 crystal growth, u.s. effects 3=23392
 crystal twinning, plastic deform. induced 3=18026
 crystals, slip, intergranular, by interferometry 3=6528
 deformation, rapid after-effect 3=18197
 de Haas—van Alphen effect 3=11029
 density variation under thermal cycling, to 250°C 3=6866
 diffusion of Cd^{113m} and Au¹⁹⁹, anisotropic 3=17793
 diffusion in Cu, saddle-point config. model 3=2789
 diffusion in GaAs, interstitial—substitutional 3=20225
 diffusion in Si, in elec. fields 3=17790
 diffusion and solubility in GaP 3=10686
 dislocation loops after plastic deform. 3=4873
 dislocation loops, electron microscope exam. 3=6525
 dislocation reactions resulting from slip 3=2797
 dislocations prod. by spark discharge 3=12869
 dislocations, rel. to irradiation 3=20178
 elec. resistance, rel. to impurity 3=25324
 elec. resistance, 10°–14°K 3=2852
 electronic structure, from acoustic data 3=10623
 embrittlement by liq. Hg 3=18006
 etching and dislocations on {10 $\bar{1}$ 0} faces 3=10676–7
 fatigue, slip processes correl. with hardening 3=20748
 fatigue straining, dynamic recovery 3=20749
 Fermi surface 3=25244
 Fermi surface, magnetoelec. data 3=12945
 Fermi surfaces, open cross-sections 3=17687
 growth of single crystals, effect of sound waves 3=6828
 internal friction, polycrystalline, and creep 3=18190
 liquid, Hall effect 3=16638
 liquid self-diffusion in Sn plus Zn mixture 3=5432
 magnetoplasma resonance, l.f., meas. 3=8409
 magnetoresistance, dimensional and purity effects at low temp. 3=15554

Zinc — contd

- magnetoresistance, transverse, and periodic mag. breakdown 3=20276
 mechanical strength, torsion, and tensile strength—endurance relation 3=18208
 meteorites, abundance 3=11527
 molten, elec. resist. and Hall effect 3=9475
 monocrystals, cathode disintegration anisotropy 3=7658
 plastic deformation, initial 3=18181
 plasticity, single crystals, temp. transition from brittleness 3=23316
 properties calc. from first princs. 3=8395
 recrystallization and boundary migration 3=23407
 shear strength, -50° to 200°C , up to 10^5 kg cm^{-2} 3=13375
 shock compression up to $9 \times 10^5 \text{ atm}$ 3=6786
 single crystals, growth by zone recryst. from wire 3=5088
 in Sn, effect on structure and microhardness 3=3334
 in Sn recrystallized surface, effect on microhardness and structure 3=20760
 solubility in GaAs 3=18122
 spark discharge, ion concn., time variation 3=2553
 spectra, in plasma, effect of metallic oxides 3=9812
 spin—orbit coupling in electron band structure 3=10626
 sputtering by Ar^+ , 1.2 MeV, preferential ejection 3=7656
 sputtering, deposit patterns 3=22877
 strain recovery, nonelastic, meas. 3=8776
 stress/strain effects, rel. to irradiation 3=18174
 substructure microsegregations and critical shear stress 3=6792
 surface texture, effect on spreading of liquid Hg 3=5427
 tensile strength, rel. to β -irradiation 3=8781
 thermal cycling effect on mechanical, elec. props. 3=3233
 twinning, structure of accommodation region 3=8801
 u.s. absorption coeff., quantum oscillation 3=2723
 vacancies, energies of formation, movement 3=10646
 vapour, anomalous flow through Pyrex tubing 3=14195
 work hardening and fracture 3=18200
 X-ray emission spectra, M-series 3=23088
 Zn VIII triplet at 160 Å 3=9593
 Zn^{66} , diffusion rate in Cu, small penetration 3=13001

Zinc compounds

- alloys, impurity electronic structure 3=22757
 silicate, Mn activated, decay of cathodoluminescence 3=3066
 zincblende, structural stability under high-pressure 3=23375
 Ag—Zn alloys, transport numbers, various phases 3=11354
 Zn acetate aq., u.s. absorption 3=3803
 ZnAl, electron emission microscopy 3=20973
 Zn—2% Au, crystal structure, rapidly solidified, regular cell pattern 3=23470
 (Zn,Cd)S:Ag, 75:25, luminescence, for temp. meas. 3=8622
 $\text{Zn}_2\text{Cd}_{1-x}\text{Sb}_x$, i.r. absorption pleochroism 3=923
 (Zn—Cd)S, luminesc., activator chemistry 3=3051
 (Zn,Cd)S phosphors, coactivator emission 3=10998
 ZnCdS phosphors, trapped electrons, e.s.r. 3=23238
 (Zn,Cd)(S,Se), red-emitting electroluminesc. 3=13217
 (Zn,Cd)S : Cu phosphors, crystal structure, atomic, X, γ -ray effects 3=23457
 ZnCdS:Mn, luminesc., prior sensitization 3=10994
 ZnCdS:Mn, luminescence, by X-rays a.c. components prod. by 10^4 V/cm at 400 c/s 3=15710
 ZnCdS—Mn, luminescence, enhancement by electric field 3=6673
 ZnCl_2 , amine complex, structure, moments 3=15358
 ZnCl_2 , aq. soln., freezing 3=3927
 ZnCl_2 , fused, refractive index rel. to temperature 3=11796
 ZnCl_2 , phosphor, sulphide activated 3=950
 Zn—Cu alloys, corrosion, by NH_3 -containing atmosphere 3=8953
 Zn with Cu, spectrochemical analysis, in discharge, effect of Si, Na, time var. 3=25845
 Zn ferrite, decay phenomena, rel. to domain walls 3=8689
 ZnF_2 , fused bath, electronic & ionic conductance, 1100°C 3=1394
 ZnF_2 , growth of highly-perfect single crystals for masers 3=23397
 ZnFe_2O_4 — NiFe_2O_4 system, superparamagnetism 3=8645

Zinc compounds — contd

- ZnGeAs_2 , conductivity, thermal 100 – 700°K and order—disorder transform. 3=20118
 ZnGeAs_2 , thermoelec. power, resist., Hall const., thermal cond. and diffusivity 3=8518
 ZnIn_2Se_4 , crystal structure and electrical properties 3=25350
 ZnIn_2Se_4 , semiconductor, prep. and props. 3=864
 ZnIn_2Te_4 , crystal structure and electrical properties 3=25350
 ZnIn_2Te_4 , semiconductor, prep. and props. 3=864
 Zn—Mn alloy, de Haas—van Alphen effect 3=11029
 Zn—Mn—Fe ferrites, permeability, anisotropy 3=20619
 ZnO, aerosols, precipitation, by l.f. spiral acoustic field 3=18462
 ZnO, crystallographic polarity 3=11259
 ZnO, diffuse reflectance absorpt. spectrum 3=13190
 ZnO, donors and acceptors, e.s.r. 3=13309
 ZnO, doped with Li, Ni, Cu, luminesc. 3=23111
 ZnO, double acceptor luminescence 3=15704
 ZnO, "edge" and green luminescence emission rel. to elec. cond. 3=3048
 ZnO, elastic moduli of single crystals 3=1213
 ZnO, electroluminescence meas. 3=18048
 ZnO, electron paramagnetic resonance, photo-induced 3=6751
 ZnO, electrophotographic latent image formation and decay 3=5544
 ZnO, electrophotographic props. 3=9629
 ZnO films, adsorption and desorption, rel. to irradiation 3=6896
 ZnO films, luminescent, sublimation 3=16144
 ZnO, high-pressure polymorph 3=3254
 ZnO : Li, u.v.-induced centre, e.s.r. 3=13310
 ZnO, luminescence and absorption 3=957
 ZnO, luminescence and cond. elec., effect of absorbed O 3=6679
 ZnO, luminescence, effect of Cu activation 3=20524
 ZnO, Mössbauer spectrum at 92 keV 3=6460
 ZnO, non-ohmic cond., rel. to u.s. amplification 3=12919
 ZnO, photoconductivity, kinetics, effect of binders 3=17964
 ZnO, photoconductivity and photodiodelectric effect 3=23023
 $7\text{ZnO} \cdot \text{Sb}_2\text{O}_3$, spinel, growth and lattice const. 3=3274
 ZnO, thermoluminescence 3=8633
 ZnO, u.v. and cathodoluminesc., mechanism 3=3047
 ZnO_2 , diffuse reflectance absorpt. spectrum 3=13190
 ZnO—TiO_2 —NiO ceramics, temp. coeff. of resist. 3=13117
 ZnP_2 , structure of tetragonal, monoclinic forms 3=16072
 $\text{Zn}_3(\text{PO}_4)_2$, γ -phase, crystal structure and luminescence 3=6849
 ZnS, a.c. field excit. of rare earths 3=25496
 ZnS, absorption edge, rel. to vector orient. 3=10970
 ZnS, absorption edge shift rel. to elec. field 3=6655
 ZnS, α -ray scintill., field quenching model 3=13208
 ZnS, carrier distrib. due to inhomog. excitation 3=2928
 ZnS, crystal growth, Frerich's method 3=6826
 ZnS, crystal growth, from melt, 100 – 200 atm . of N_2 3=18244
 ZnS, crystal growth from vapour phase 3=8804
 ZnS crystal growth, with HCl as vapour solvent 3=13412
 ZnS, crystals, forbidden bandwidth and effective ion charge 3=20344
 ZnS, crystals, refractive index 3=13152
 ZnS, cubic and hexagonal, e.s.r. of Cr^{3+} 3=3170
 ZnS, dielec. props. at 7.25 Mc/s 3=17932
 ZnS, dislocations and wide stacking faults 3=4874
 ZnS, dissociation energy $D_0 < 50 \text{ kcal/mole}$
 ZnS, double acceptor luminescence 3=15704
 ZnS, e.s.r. of Cr^{3+} , Mn^{2+} , Fe^{3+} 3=20648
 ZnS, elastic constants 3=8751
 ZnS, electroelastic props., meas. and model 3=8556
 ZnS, electroluminescence 3=4992
 ZnS, electroluminescence 3=8631
 ZnS, electroluminescence, Cu activated, a.c., pulsed 3=18046
 ZnS, electroluminescence, effect of crystal size 3=20537
 ZnS, electroluminescence and electrophotoluminescence 3=966
 ZnS, electroluminescence, four aspects 3=23124
 ZnS, electroluminescence, frequ. factor and trap depth 3=23125

Zinc compounds — contd

- ZnS, electroluminescence of powder particles 3=11012
- ZnS, electroluminescence, rel. to voltage phase angle 3=3068
- ZnS, electroluminescence, review 3=13220
- ZnS electroluminescent cells, dielec. props. 3=2947
- ZnS, evap., u.v. absorption coeff. 3=926
- ZnS films, d.c. electroluminescence 3=15720
- ZnS films, luminescent, sublimation 3=16144
- ZnS, films, structure from optical const., adsorption formation theory 3=13560
- ZnS, forbidden band width and effective charge 3=10621
- ZnS formation from vapour, chem. transport 3=25673
- ZnS, γ -ray induced conductivity 3=2908
- ZnS, γ -ray luminesc., effect of elec. field 3=8629
- ZnS-group phosphors, luminescence excitation by modulated light 3=20525-6
- ZnS, growth of hollow hexagonal crystals 3=11237
- ZnS, Gudden-Pohl flashes 3=18050
- ZnS, i.r. luminescence, model of centre 3=8621
- ZnS, internal force const. calc. 3=10580
- ZnS lattice absorption, 8° to 420°K 3=10967
- ZnS lattice absorption i.r. bands, shell model applic. 3=10927
- ZnS lattice, current carrier energy spectrum change due to deformation 3=2877
- ZnS, luminesc., activator chemistry 3=3051
- ZnS, luminesc., double activation by Ag and Sm 3=3057
- ZnS, luminescence after room temp. prep. 3=10997
- ZnS, luminescence, blue bands 3=10995
- ZnS, luminescence, effect of growth conditions 3=6675
- ZnS, luminescence, effect of synthesis conditions 3=25487
- ZnS, luminescence emission shifts, rel. to activators, lattice extension and compression 3=8625
- ZnS, luminescence: i.r. effect and anti-Stokes emission 3=3049
- ZnS, luminescence, n irradiated, quenching by Cu or Co 3=18039
- ZnS, luminescence, pressure effect 3=18035
- ZnS, luminescence quenching in nucl. reactor 3=4987
- ZnS, luminescence, red, preparation conditions 3=18038
- ZnS, luminescence rel. to crystal size 3=954
- ZnS, luminescence rel. to defects 3=22705
- ZnS, luminescence, self-activ. 3=8623
- ZnS, luminescence, self-activated, polarization, 77°K 3=20531
- ZnS, ohmic contacts 3=8530
- ZnS phosphors, cathodolumin., elec. field effects 3=3085
- ZnS phosphors, coactivator emission 3=10998
- ZnS phosphors, electroluminescence excited by square pulses 3=15722
- ZnS phosphors, escape of trapped electrons 3=20529
- ZnS phosphors, excitation energy storage, transfer 3=15699
- ZnS phosphors, excitation spectra meas. 3=18037
- ZnS phosphors, excitation spectra theory 3=18036
- ZnS phosphors, flash, three-trapping-levels model 3=3050
- ZnS phosphors, i.r. stimulation and quenching 3=6677
- ZnS phosphors, luminescence, 14-77°K, and shallow trapping levels 3=23132
- ZnS phosphors, luminescence, steady-state 3=20527
- ZnS phosphors, photodielec. effect 3=13105
- ZnS phosphors, trap filling by field excitation 3=23126
- ZnS phosphors, u.v.-excited, i.r. effects 3=23110
- ZnS phosphors, with impurities, spectroscopic analysis 3=941
- ZnS photoelectrets, effects of γ, β -rays 3=15622
- ZnS, photoelectroluminesc., u.v. 3=3070
- ZnS, photovoltage model 3=25421
- ZnS powders, htd, in Zn atmosphere, carrier conc. 3=13084
- ZnS, reflection spectrum of wurtzite structure 3=8583
- ZnS, reflectivity in interband transition region 3=8582
- ZnS, scintillation efficiency increase 3=23119
- ZnS, self- and Cu-activ., diamagnetism 3=11028
- ZnS, single crystals, electroluminescence due to Cu migration 3=13216
- ZnS, spectra, thermoluminescence and luminescence rel. to impurities 3=20528

Zinc compounds — contd

- ZnS, stacking faults 3=8444
- ZnS, stacking faults, pressure-induced 3=20207
- ZnS, stacking faults, X-ray scatt. 3=17771
- ZnS, thin films, dielectric constant 3=8555
- ZnS, transition metal impurities, luminesc. and crystal fields 3=3054
- ZnS, trapping levels, thermoluminesc. data 3=11019
- ZnS, u.v. irradi. in different gases 3=10969
- ZnS, u.v. luminescence 3=4989
- ZnS, vacancy concn., Dember effect meas. 3=20161
- ZnS, wurtzite form, elastic moduli 3=18159
- ZnS, zinc blende, bond character rel. to SiC and $A^{III}B^V$ cpds. 3=2688
- ZnS:Ag, luminescence emission shifts 3=8625
- ZnS:Ag, luminescence excitatn. by ions 3=970
- ZnS:Al, luminescent centre e.s.r. 3=8717
- ZnS:Al²⁺, e.s.r. correl with photocond. meas. 3=18128
- ZnS:Au, luminescence emission shifts 3=8625
- ZnS-CdS, Cu-activated, reaction enthalpy 3=6678
- ZnS-CdS-Mn, Mn²⁺, excitation bands 3=6676
- ZnS, Cu-activated electroluminescence 3=3069
- ZnS:Cu, conversion of green to blue centres 3=25488
- ZnS:Cu, elec. and electroluminescence props. 3=20345
- ZnS:Cu, electroluminescence 3=11016
- ZnS:Cu, electroluminescence rel. to Cu diffusion temp. 3=15723
- ZnS:Cu, electroluminescence, avalanche processes 3=18049
- ZnS:Cu, electroluminescence, avalanche processes 3=11014
- ZnS:Cu, electroluminescent, photodielec. effect 3=15614
- ZnS:Cu, luminesc., rel. to Cu incorporation 3=10996
- ZnS:Cu, luminesc., role of additional impurities 3=8624
- ZnS:Cu, luminescence, coactivation by In 3=4988
- ZnS:Cu, luminescence emission shifts 3=8625
- ZnS:Cu, luminescence and growth defects 3=3055
- ZnS:Cu, luminescence kinetics, excited by α -rays and light pulses 3=955
- ZnS:Cu, luminescence — photoconductivity relationship 3=25422
- ZnS:Cu, luminescence polarization 3=3056
- ZnS:Cu, by neutron irradi. of ZnS, optical props. 3=13207
- ZnS:Cu phosphor, de-excitation by X-rays 3=13197
- ZnS:Cu phosphors, activated, exo-electron emission 3=956
- ZnS:Cu phosphors, electroluminescence 3=11010
- ZnS:Cu:Al, electrolum. of single crystals 3=6683
- ZnS:Cu; Al luminor, thermoluminescent light sums rel. to electroluminescence 3=3074
- ZnS:Cu:Al phosphors, electroluminescent pulse excitation 3=18047
- ZnS:Cu, Cl, electroluminescence, temp. depend. 3=11013
- ZnS:Cu:Cl, luminescence, build-up of blue and green bands 3=3052
- ZnS:Cu, Cl, photoconductive effect, impedance changes 3=911
- ZnS:Cu, Cl, stacking faults and electro-luminescence 3=23123
- ZnS:Cu(Cl,Br,I), electroluminescence 3=11009
- ZnS:Cu and Mn, electroluminescence 3=11015
- ZnS:Cu:Pb, electroluminescence 3=20545
- ZnS-Cu, Pb, optical flash regularities 3=3053
- ZnS:Ga phosphors, thermoluminescence and e.s.r. studies 3=23131
- ZnS-HCl system, vapour transport of solid 3=8945
- ZnS:Mn, luminescence, by X-rays a.c. components prod. by 10⁴V/cm at 400 c/s 3=15710
- ZnS:Mn, photoelec. rel. to luminescence 3=15711
- Zn(S:Se):Cu phosphors, electroluminescence 3=13218
- ZnS, Se:Cu, Cl, luminescence 3=6674
- ZnS:Tm, luminescence, blue lines 3=13210
- ZnS:V, luminescence and crystal field 3=20530
- ZnSb, crystal growth, zone melting 3=8807
- ZnSb, electrical properties, rel. to temp. 3=25373
- ZnSb, electron states 3=17685
- Zn-Sb, phase composition, X-ray analysis 3=8895
- ZnSb, semiconducting, electron states, extremal points, dispersion 3=17684
- e-Zn₂-Sb₂, conductivity electrical and thermoelectricity, 20-470°C 3=20346

Zinc compounds — contd

- ZnSb₃, semiconducting props. 3=15597
 β -ZnSb₃, semiconducting, conductivity, thermoelectricity, crystal growth 3=22956
 ZnSb—CdSb, pseudo-binary section, structure 3=1348
 ZnSe, atom displacement by electron beams 3=8476
 ZnSe, carrier mobility and shallow impurity states 3=10843
 ZnSe, crystals hexagonal modification 3=16070
 ZnSe, double-acceptor defect by electron irradi. 3=25268
 ZnSe, double acceptor luminescence 3=15704
 ZnSe, electroelastic props., meas. and model 3=8556
 ZnSe, electro-optical effects 3=15657
 ZnSe, γ -ray induced conductivity 3=2908
 ZnSe, luminescence, edge, 4.2°K 3=23109
 ZnSe, p-n junctions, electroluminescence 3=11011
 ZnSe, solubility in CdS 3=4886
 ZnSe, surface triangular growth patterns 3=18273
 ZnSe thermal expansion, anomalous negative low-temp. values 3=10603
 ZnSe, vapour pressure, 1060°-1393°K meas. 3=1871
 ZnSe—CdSe, film formation and semicond. props. 3=2882
 ZnSe—HgSe, film formation and semicond. props. 3=2882
 Zn₂SiO₄:Mn, trapping centres rel. to luminescence 3=13209
 Zn—Sn monocrystals, growth by zonal recryst. from wire 3=5088
 ZnSnAs₂, conductivity, thermal, 100-700°K and order-disorder transform 3=20118
 ZnSnAs₂, crystal structure, chalcopyrites or zincblende? 3=11267
 ZnSnAs₂, thermoelec. power, resist., Hall const., thermal cond. and diffusivity 3=8518
 ZnSO₄·H₂O, crystal structure 3=18327
 ZnSO₄·7H₂O, u.s. velocities, elastic consts., and structure 3=20690
 ZnTe bound excitons 3=10630
 ZnTe, carrier mobility and shallow impurity states 3=10843
 ZnTe crystals, growth and decoration 3=16049
 ZnTe, electroelastic props., meas. and model 3=8556
 ZnTe, γ -ray induced conductivity 3=2908
 ZnTe, lattice distortion by Mn²⁺, e.s.r. det. 3=25167
 ZnTe, Mössbauer effect with Te^{125m} source 3=2367
 ZnTe, optical transitions, direct and phonon-assisted 3=10968
 ZnTe, reflection and luminesc. spectra 3=25467
 ZnTe, reflectivity and band structure 3=17979
 ZnTe, resistance and Hall coeff. 3=25374
 ZnTe, solubility in CdS 3=4886
 ZnTe—CdS heterojunctions, growth and props. 3=23419
 ZnTe—CdTe, film formation and semicond. props. 3=2882
 Zn Te: Mn, spin resonance, 3a cubic fld. splittings 3=1192
 ZnWO₄, e.s.r. of Cr³⁺ 3=3169
 ZnWO₄:Cr³⁺, e.s.r. and spin-lattice relax. 3=25569
 ZnWO₄:Fe³⁺, e.s.r. and spin-lattice relax. 3=25569
 Zn₂Y, spin-wave excitation in parallel pumping 3=15885

Zirconium

- anodic film, structure 3=23507
 cold-work recovery rel. to neutron irradi. 3=11171
 crystal twinning, deformation, on {1121}, possible double process 3=20779
 crystals, twinning, zig-zag 3=11214
 de Haas—van Alphen effect, up to 190 kG 3=25502
 deuteron scatt., 11.8 MeV, elastic and inelastic 3=17490
 diffusion, self, thermal, high temps. 3=22828
 dislocations in deformed Zr 3=10674
 dislocations, rel. to impurities 3=17745
 electron emission due to Ar⁺ bombardment 3=9843
 electron emission, filament temp. 3=14629
 ions, hot, from U fission, exchange with ZrCl₄ 3=21006
 neutron irradi., relaxation strains 3=20717
 phase transformations, solid—solid, 0-90 kbar 3=20887
 photovoltaic effect at low temps. 3=15636

Zirconium — contd

- solubility in Be, X-ray diffrac. study 3=20908
 specific heat, 1.1°-4.5°K 3=15437
 superconductive temp. controller, below 1°K 3=1880
 Zr⁴⁺ e.s.r. in glass, 450-9320 Mc/s, 77°-295°K 3=20660
 Zr⁹⁵—Nb⁹⁵ pair, analysis by β - γ coincidences 3=5990

Zirconium compounds

- alloys, superconductivity 3=16873
 Zircaloy-2, cold-work recovery rel. to neutron irradi. 3=11171
 Zircaloy-2, tensile strength, rel. to irradi. effects 3=11170
 Zircaloy-2 and 3, second phase, composition 3=5131
 Zr alloys, dilute, specific heat 1.2°-4.5°K 3=25199
 ZrB₃, quadrupole bond, n.m.r. meas. and calc. 3=11121
 ZrC, thermionic emission, 1300°-1900°K 3=16974
 ZrCl₄, exchange with Zr^{IV} ions, hot from U fission 3=21006
 ZrCo₂—ZrFe₂ alloys, structure and mag. props. 3=20880
 Zr—H system, precipitation 3=20905
 ZrH₂, lattice dynamics by axisymm. model 3=2711
 ZrH₄, precipitation in Zr, by electron micr. 3=11294
 Zr—Nb, heat treatment, neutron effects on mech. props. 3=1234
 Zr—Nb, paramag. susceptibility, rel. to temp. 3=999
 Zr—Nb, superconducting in high mag. fields 3=16879
 ZrO₂, defect structure rel. to O₂ press. 3=12957
 ZrO₂ films, optical props. and structure 3=8577
 ZrO₂, monoclinic—tetragonal transition 3=25654
 ZrO₂ ppt. on grown-in dislocations in MgO 3=10673
 ZrO₄, stabilized, elec. resist. meas. 3=20376
 ZrO₂, tetragonal, crystal structure 3=6845
 ZrO₂—CaO, fluorite phase, X-ray and elec. cond. study 3=25728
 ZrO₂—CaO solid solution, electrical conductivity ionic 3=8550
 (87%)ZrO₂—(13%)La₂O₃, electrical conductivity, 1200°-1650°C 3=17901
 ZrO₂—PbO—TiO₂ system 3=3255
 Zr—Rh alloys, superconducting transition temp. 3=21669
 Zr—Rh, superconductivity 3=9688
 ZrSiO₄, zircon, e.s.r. 3=23239
 Zr—Ti—O long-range ordering 3=3289
 Zr_{1-x}U_xFe₂, hyperfine field 3=15412

Zodiacal light

- measurement and theory of light and counter-glow 3=11529
 space density det. 3=7023
 spectrum, rel. to interplanet. electron density 3=1509
 tropospheric scatt. effect 3=11530

Zone melting and refining

- alkali halides 3=6825
 imidazole, effect on semiconducting props. 3=10826
 impurity motion, infinite ingot 3=20802
 impurity movement in finite ingot 3=25674
 impurity var. with cycle number, theory 3=25676
 induction heating, > 2000°C 3=11238
 migration of liquid zone through solid 3=23408-9
 organic cpds., automatic zone refiner 3=8809
 two-component system, math. analysis 3=25675
 Al 3=23487
 Al, super-pure 3=20803
 Au, activation analysis 3=3345
 CdSb single crystals 3=5087
 GaAs, contamination 3=1274
 GaAs growth from Ga 3=23410
 Ge—Al liquid zone, migration through Ge 3=23408-9
 NH₄ alum, reagent grade 3=1265
 Pb 3=23487
 Si, induction vacuum apparatus without quartz 3=25677
 Te, high-purity, prod. and analysis 3=18684
 W, effect on tensile props. 3=25617
 ZnSb, crystal growth 3=8807

Zoology

- fish, acoustic scatter patterns 3=1775

SUBJECT INDEX HEADINGS

The headings used in the Alphabetical Subject Index are listed below. The headings are grouped into sections on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. Each section lists the headings which concern its subject and it follows that many of the headings are listed in several places. An introduction to the Subject Index will be found on page S 1.

GENERAL

Bibliographies
Biographies
Books
Collections of physical data
Conferences
History
Instruments
Laboratories

Laboratory apparatus
[and technique]
Measurement
errors
Nomenclature and symbols
Physics
Physics fundamentals
Recording
Reviews

UNITS. STANDARDS. CONSTANTS

Constants
Dimensions
Nomenclature and symbols
Standards
Units

EDUCATION

Biographies
Books
History
Laboratories
Laboratory apparatus
[and technique]

Measurement
errors
Physics fundamentals
Reviews
Teaching
demonstrations

MATHEMATICAL PHYSICS

Algebra
Calculating apparatus
analogue apparatus
differential analysers
digital computers
Calculation
Differential equations
Equations
Field theory, classical

Fluctuations
Fourier analysis
Functions
Geometry
Graphs
Group theory
Information theory
Integral equations

Integrals
Mathematics
Matrices
Nomograms
Polynomials
Probability
Radiation
Series
Sliderules

Statistical analysis
applications
applications, counters
Tables, mathematical
Tensors
Transformations, mathematical
Vectors
Waves

GRAVITATION . RELATIVITY

Gravitation
Relativity
general
special
unified field theories

STATISTICAL PHYSICS

Brownian movement
Fluctuations
Hysteresis
Indeterminacy
Information theory
Probability
Quantum theory
many-particle systems

Random processes
Relaxation
Statistical analysis
applications
Statistical mechanics
Thermodynamics

QUANTUM THEORY

Collision processes
Dispersion relations
Field theory, quantum
interactions
interactions, strong
interactions, weak
meson field
quantization
Parity

Quantum electrodynamics
Quantum theory
application methods
quantization
wave equations
many-particle systems
S-matrix theory
Scattering

TRANSPORT PROCESSES

Diffusion
Radiation
Transport processes

MECHANICS

Ballistics
Bending
Centrifuges
Damping
Dynamics
Elasticity

Friction
Gravitation
Gyroscopes
Impact
Kinematics

Mechanics
Pendulums
Plasticity
Pressure
Relaxation

Rockets
Rotating bodies
Stress analysis
Thermoelasticity
Torsion
Velocity

MECHANICAL MEASUREMENTS

Acceleration measurement	Curvature measurement	Mechanical measurement	Thickness measurement
Alignment	Density measurement	Micrometry	Time interval measurement
Altimeters	Dynamometers	Particle size	Time measurement
Anemometers	Force measurement	Pressure measurement	Torquemeters
Angle measurement	Interferometry	Strain gauges	Vapour pressure measurement
Angular velocity measurement	Length measurement	Stroboscopes	Velocity measurement
Area measurement	Manometers	Surface measurement	Volume measurement
Balances			Weighing

FLUIDS

Flow
Fluids
Hydrodynamics
Hydrostatics

MECHANICS OF LIQUIDS

Acoustic streaming	Drops	Hydrodynamics	Schlieren systems
Bubbles	Elasticity	Hydrostatics	Sprays
Capillarity	liquids	Jets	Surface energy
Cavitation	Emulsions	Liquid oscillations	Surface tension
Compressibility	Films	Liquid waves	Surface tension measurement
liquids	liquid	surface	Thixotropy
Density	Filters	Lubrication	Turbulence
liquids	Flow	Moisture	Viscometers
Diffusion in liquids	liquids	Pressure	Viscosity
thermal	Flowmeters	Pumps	liquids
Double refraction	Foams	Radiation pressure	Vortices
flow	Heat of wetting	Rheology	Wetting

LIQUID STATE

Absorption	Diffusion in liquids	Magnetic properties of	Semiconducting materials
acoustic waves	thermal	[substances]	Semiconductors
acoustic waves, ultrasonic	Electroluminescence	Magnetic resonance and	Solubility
Association	Equations of state	Membranes [relaxation	Solutions
liquids	liquids	Metals [and relaxation	Sorption
Breakdown, electric	Filters	Nuclear magnetic resonance	Spectra
liquids	Heat of solution	Nuclear quadrupole resonance	inorganic liquids and solutions
Conductivity, electrical	Interference	Osmosis	Thermoluminescence
electrolytic	acoustic waves	Paramagnetic resonance	Transmission
Conductivity, thermal	Liquid crystals	Polymers [and relaxation	acoustic waves
liquids	Liquids	Reflection	acoustic waves, ultrasonic
Dielectric properties of subst.	structure	acoustic waves	Velocity
liquids and solutions	theory	acoustic waves, ultrasonic	acoustic waves
Diffraction	Luminescence	Refraction	acoustic waves, ultrasonic
acoustic waves	liquids and solutions	acoustic waves	X-ray examination of materials
acoustic waves, ultrasonic		acoustic waves, ultrasonic	liquids
Diffusion		Scattering	
acoustic waves		acoustic waves	
		acoustic waves, ultrasonic	

MECHANICS OF GASES

Acoustic streaming	Diffusion in gases	Jets	Vaporization
Aerodynamics	thermal	Liquefaction, gases	Vapour pressure
Anemometers	Flow	Manometers	Viscometers
Compressibility	gases	Moisture	Viscosity
gases	Flowmeters	Pressure	gases
Condensation	Gases	Pumps	Vortices
Density	Humidity	Supersonic flow	Waves
gases	Hygrometers	Turbulence	

GASEOUS STATE

Absorption
 acoustic waves
 acoustic waves, ultrasonic
Association
 gases
Breakdown, electric
 gases
Conductivity, thermal
 gases
Dielectric properties of subst.
 gases
Diffraction
 acoustic waves
 acoustic waves, ultrasonic

Diffusion
 acoustic waves
Diffusion in gases
 thermal
Electroluminescence
Equations of state
 gases
Gases
Helium
 gas
Interference
 acoustic waves
Joule—Thomson effect
Kinetic theory
 gases

Luminescence
 gases
Magnetic resonance and
Molecules [relaxation
 intermolecular mechanics
Nuclear magnetic resonance
 [and relaxation
Nuclear quadrupole resonance
Paramagnetic resonance and
Reflection [relaxation
 acoustic waves
 acoustic waves, ultrasonic
Refraction
 acoustic waves
 acoustic waves, ultrasonic

Scattering
 acoustic waves
 acoustic waves, ultrasonic
Sorption
Spectra
Statistical mechanics
Thermoluminescence
Transmission
 acoustic waves
 acoustic waves, ultrasonic
Velocity
 acoustic waves
 acoustic waves, ultrasonic

VACUUM PHYSICS

Glass—metal seals
Leak detection
Sputtering
Vacuum apparatus

Vacuum gauges
Vacuum pumps
Vacuum technique

VIBRATIONS . WAVES . ACOUSTICS

Acoustics
Elastic waves

Shock waves
Vibrations

VIBRATIONS . ELASTIC WAVES

Damping
Elastic waves
Membranes
Oscillations
Piezoelectric oscillations
Relaxation
Resonators

Seismic waves
Shock waves
 effects
Vibrating bodies
Vibrations
 excitation
 measurement
Waves

SHOCK WAVES

Detonation
Explosions
Schlieren systems
Shock tubes
Shock waves
 effects
Supersonic flow

ACOUSTICS

Absorption
 acoustic waves
 acoustic waves, ultrasonic
Acoustic analysis
Acoustic generators
Acoustic impedance
Acoustic radiators
Acoustic receivers
Acoustic resonators
Acoustics
 musical
Acoustic streaming
Acoustic transducers
Acoustic wave propagation
 ultrasonic

Acoustic waves
 effects
Acoustoelectric effects
Atmospheric acoustics
Biological effects of radiations
Chemical effects of radiations
 acoustic waves
Diffraction
 acoustic waves
 acoustic waves, ultrasonic
Diffusion
 acoustic waves
Dispersion, acoustic
 ultrasonic
Doppler effect

Ear
Hearing
Helium
 liquid, sound propagation
Interference
 acoustic waves
Magnetoacoustic effects
Microphones
Musical instruments
Physical effects of radiations
Radiation pressure
Reflection
 acoustic waves
 acoustic waves, ultrasonic
Refraction
 acoustic waves
 acoustic waves, ultrasonic

Scattering
 acoustic waves
 acoustic waves, ultrasonic
Schlieren systems
Sound ranging
Sound recording
Sound reproduction
Speech
Transmission
 acoustic waves
 acoustic waves, ultrasonic
Ultrasonics
Velocity
 acoustic waves
 acoustic waves, ultrasonic

Instruments and Measurements

Acoustic analysis
Acoustic generators
Acoustic measurement
Acoustic radiators
Acoustic receivers
Acoustic resonators
Acoustic transducers
Acoustical laboratories
Hearing aids
Intensity measurement
 acoustics

Interferometers
 acoustic waves
Interferometry
 acoustic waves
Microphones
Sound recording
Sound reproduction
Stroboscopes
Velocity measurement
 acoustic waves
 acoustic waves, ultrasonic

Noise . Architectural Acoustics

Architectural acoustics
Echo
Noise
 acoustic
Noise abatement
Reverberation

OPTICS

Atmospheric optics
Doppler effect
Electro-optical effects
Light
 e.m. theory
Light sources
Optics
Photons

Photophoresis
Radiation
Radiation pressure
Velocity
 light
Velocity measurement
 light

PHOTOMETRY . COLORIMETRY

Bolometers	Colorimeters	Emissivity	Photometry
Brightness	Colorimetry	Illumination	light sources
Colour	Densitometry	Photometers	Pyrometers
			Radiation detectors

GEOMETRICAL AND INSTRUMENTAL OPTICS

Aberrations, optical	Masers	Optical materials	Refraction
Dispersion, optical	optical	Optical pumping	light
Filters, optical	Microscopes	Optical systems	Refractive index
Glass	Microscopy	Optics	light
Image convertors and	Mirrors	geometrical	Refractive index measurement
Lenses [amplifiers	Optical constants	Prisms, optical	Refractometers
aspherical	Optical films	Projectors, optical	Resolving power, optics
photographic	Optical images	Quartz	Schlieren systems
Light sources	Optical instruments	Reflection	Stereoscopy
Luminescent devices	Optical instrument testing	light	Stroboscopes
		Reflectivity	Telescopes

SPECTROSCOPY

Astronomical spectra	Spectra	Spectral line breadth	Spectroscopy
Atmospheric spectra	continuous	Spectrochemical analysis	light sources
Monochromators	flames	Spectrometers	Stark effect
Raman spectra	resonance	accessories	Temperature measurement
inorganic	atoms	Spectrophotometers	spectral methods
organic	inorganic molecules	Spectrophotometry	Zeeman effect
	diatomic		
	diatomic, radiofrequency		
	polyatomic		
	polyatomic, radiofrequency		
	inorganic liquids and solutions		
	inorganic solids		
	radiofrequency		
	organic molecules and substances		
	infrared		
	radiofrequency		

PHYSICAL OPTICS

Absorption	Electro-optical effects	Optical films	Refraction
light	Filters, optical	Optical pumping	light
Diffraction	Interference	Optical rotation	Refractive index
light	light	Photoelasticity	light
Diffraction gratings	Interferometers	Pleochroism	Scattering
Diffusion	light	Polarimeters	light
light	Interferometry	Polarized light	Transmission
Dispersion, optical	light	Reflection	light
Doppler effect	Magneto-optical effects	light	Transparency
Double refraction	Optical constants	Reflectivity	
flow			
mechanical			

PHOTOGRAPHY

Cameras	Photographic process
Cinematography	development
Densitometry	Photography
Lenses	applications
photographic	colour
Nuclear track emulsions	high-speed
Photographic light sources	infrared
Photographic materials	Radiography
sensitivity	

HEAT

Calorimeters	Earth	Heat of fusion	Latent heat
Calorimetry	heat	Heat of reaction	Specific heat
Combustion	Flames	Heat of solution	Temperature
Conductivity, thermal	Heat	Heat of sublimation	Temperature distribution
gases	Heat conduction	Heat of transformation	Temperature measurement
liquids	Heating	Heat of vaporization	spectral methods
solids	Heat of adsorption	Heat of wetting	Thermal expansion
measurement	Heat of combustion	Heat transfer	Thermal measurement
Convection	Heat of crystallization	Heat treatment	Thermocouples
Cooling	Heat of dissociation	High-temperature production	Thermometers
Cryostats	Heat of formation	[and effects]	resistance
			Thermostats

RADIATION

Bolometers	Radiation
Emissivity	heat
Pyrometers	Radiation detectors
	Radiation pressure

CHANGE OF STATE

Boiling	Evaporation	Heat of vaporization	Supercooling
Boiling point	Freezing	Humidity	Thermal transformations
Condensation	Heat of fusion	Melting	Vapour pressure
Critical constants, thermal	Heat of sublimation	Melting point	Vapour pressure measurement
Distillation	Heat of transformation	Phase transformations	Vaporization
Drying		Sublimation	

THERMODYNAMICS

Entropy	Joule—Thomson effect
properties of substances	Thermodynamic properties
Equations of state	Thermodynamics
gases	applications
liquids	
solids	

LOW-TEMPERATURE PHYSICS

Cryostats	Low-temperature production
Joule—Thomson effect	Low-temperature technique
Liquefaction, gases	Magnetic cooling
Low-temperature phenomena	Quantum theory
	many-particle systems

Liquid and Solid Helium

Helium
liquid
liquid, sound propagation
solid
Superfluidity

Superconductivity

Superconductivity

ELECTRICITY AND MAGNETISM

Electricity
Electromagnetism
Magnetism

ELECTRICAL MEASUREMENTS AND CIRCUITS

Amplifiers	Filters, electrical
Circuits	Fluctuations
Counting circuits	electrical
Dielectric measurement	High-voltage production
Electrical measurement	Image convertors and amplifiers

ELECTROSTATICS . DIELECTRICS

Breakdown, electric	Dielectric properties of	Electric strength	Hysteresis
gases	gases [substances]	Electroluminescence	Piezoelectricity
liquids	liquids and solutions	Electrostatics	Piezoelectric oscillations
solids	solids	Electrostriction	Pyroelectricity
Contact potential	Electrets	Ferroelectric materials	Relaxation
Dielectric devices	Electric charge	Ferroelectric phenomena	Space charge
Dielectric phenomena	Electric fields	High-voltage production	Triboelectricity
	effects		

CURRENT ELECTRICITY . ELECTROKINETICS

Acoustoelectric effects	Electric charge	Fluctuations	Piezoresistance
Conduction, electrical	Electricity	electrical	Rectifiers
Conductivity, electrical	direct conversion	Hall effect	Resistance, electrical
measurement	Electrokinetic effects	Magnetoelectric effects	Semiconductors
Contact potential	Electron gas	Magnetoresistance	Skin effect
Contact resistance	Electrons	Photoconductivity	Space charge
Current, electrical	Electro-optical effects	Photoelectricity	Superconductivity
Eddy currents	Electrophoresis	Photoelectromagnetic effects	Thermoelectricity
	Filters, electrical	Photovoltaic effects	Thermocouples

IONIZATION

Dissociation	Ionization, surface
Ion velocity	Ions
Ionization	recombination
gases	scattering
liquids	Shock waves
solids	effects
Ionization potential	Space charge

ELECTRIC DISCHARGES

Arcs, electric	Discharges, electric
Breakdown, electric	high-frequency
gases	Gas-discharge tubes
liquids	Lightning
solids	Sparks, electric
Corona, electric discharge	Sputtering

PLASMA

Discharges, electric	Magnetohydrodynamics
Electron gas	Plasma
Ionization	Shock waves
gases	effects
	Space charge

Plasma Oscillations

Plasma oscillations

ELECTRON EMISSION . ELECTRON BEAMS

Cathodes	Electron gas	Electron tubes	Image converters and amplifiers
oxide	Electron lenses	Electrons	Particle optics
Electron beams	electrostatic	absorption	Photoelectric emission
effects	magnetic	ionization	Photomultipliers
Electron diffraction	Electron microscopes	radiation	Space charge
Electron emission	Electron microscopy	scattering	Thermionic emission
field emission	Electron optics	Fluctuations, electrical	electrons
secondary			Work function

ION EMISSION . ION BEAMS

Biological effect of radiations	Ion beams	Ions	Particle range
Bremsstrahlung	effects	recombination	Particle velocity analysis
Chemical effect of radiations	Ion emission	scattering	Physical effects of radiations
ionizing radiations	secondary	Ion sources	Sputtering
Gas-discharge tubes	Ion microscopes	Ion velocity	Thermionic emission
	Ion optics	Particle optics	ions

MASS SPECTROMETERS

Mass spectrometers
accessories
applications

PARTICLE ACCELERATORS

High-voltage production
Ion sources
Particle accelerators
linear
orbital

X-RAY TUBES AND TECHNIQUES

Compton effect
Dosimetry
High-voltage production
Radiation monitoring
Radiation protection

Radiography
X-ray absorption
X-ray crystallography
X-ray diffraction
X-ray examination of materials
X-ray measurement

X-ray monochromators
X-ray reflection
X-ray scattering
X-ray spectra
absorption
emission

X-ray spectrometers
X-ray spectroscopy
X-ray tubes
X-rays
effects

MAGNETISM

Antiferrimagnetism
Antiferromagnetism
Compasses
de Haas-van Alphen effect
Diamagnetism
Ferrimagnetism
Ferromagnetism

Gyromagnetic effect
Gyromagnetic ratio
Hall effect
Magnetic devices
Magnetic field measurement
Magnetic fields
effects

Magnetic measurement
Magnetic resonance and
Magnetism [relaxation]
Magnetization process
Magnetization state
Magnetoacoustic effects
Magnetoelectric effects

Magnetomechanical effects
Magneto-optical effects
Magnetoresistance
Magnetostriction
Magnetochemical effects
Magnets
Paramagnetism
Zeeman effect

ELECTROMAGNETISM . MAGNETOHYDRODYNAMICS

Eddy currents
Electricity
direct conversion
Electrodynamics

Electromagnetic fields
Electromagnetism
Electromotive force

Inductance
Magnetohydrodynamics
Plasma
Plasma oscillations

Quantum electrodynamics
Shock waves
effects

ELECTROMAGNETIC WAVES AND OSCILLATIONS

Absorption
electromagnetic waves
Diffraction
electromagnetic waves
Diffusion
electromagnetic waves
Doppler effect
Electromagnetic oscillations

Electromagnetic wave
atmosphere [propagation]
ionosphere
guided waves
Electromagnetic waves
radiators
Interference
electromagnetic waves

Interferometers
electromagnetic waves
Interferometry
electromagnetic waves
Light
electromagnetic theory
Magnetohydrodynamics
Plasma oscillations

Radiation
Reflection
electromagnetic waves
Refraction
electromagnetic waves
Scattering
electromagnetic waves

Radiofrequency Spectroscopy Techniques

Antiferrimagnetic resonance
Antiferromagnetic resonance
Cyclotron resonance
Ferrimagnetic resonance
Ferromagnetic relaxation
Ferromagnetic resonance
Nuclear magnetic resonance and
measurement [relaxation]

Nuclear quadrupole resonance
Paramagnetic resonance and
measurement [relaxation]
Spectra
Spectrometers, radiofrequency
Spectroscopy, radiofrequency

Masers

Amplifiers
Atoms
excitation
Electromagnetic oscillations
Masers
optical
Molecules
excitation
Optical pumping

NUCLEAR PHYSICS

Biological effects of radiations
Chemical effects of radiations
ionizing radiations

Nuclear physics
Physical effects of radiations
Physics fundamentals

APPARATUS . PARTICLE DETECTORS

Alpha-ray spectrometers
Beta-ray spectrometers
Counters
Cherenkov
crystal
Geiger
proportional
scintillation
semiconductor
spark
operation technique

Counters, accessories
Counting circuits
Dosimetry
Gamma-ray spectrometers
Ionization chambers
Mass spectrometers
accessories
applications

Neutron spectrometers
Particle accelerators
linear
orbital
Particle detectors
Particle optics

Particle spectrometers
Particle velocity analysis
Radioactivity measurement
apparatus
Statistical analysis
applications, counters

Track Visualization

Bubble chambers
Cloud chambers
Luminescence chambers
Nuclear track emulsions

Particle range
Particle tracks
Particle track visualization
Spark chambers

NUCLEAR FIELD THEORY

Baryons
Collision processes
Dispersion relations

Field theory, quantum
interactions
interactions, strong
interactions, weak
meson field
quantization

Fundamental particles
Leptons
Nuclear forces
Parity
Quantum electrodynamics

Quantum theory
application methods
quantization
wave equations
many particle systems
Scattering
Scattering, particles
S-matrix theory

ELEMENTARY PARTICLES

Fundamental particles
Parity
Field theory, quantum
meson field
Leptons
Baryons

Collision processes
Scattering, particles
Particle range
Particle tracks
Particle track visualization
Particle velocity analysis

Photons

Photons
scattering
interactions
polarization
Bremsstrahlung
Cherenkov radiation
Compton effect
Mössbauer effect

Gamma-rays
absorption
angular distribution
detection, measurement
effects
internal conversion
scattering
Gamma-ray spectra
Gamma-ray spectrometers

X-rays

X-rays
effects
X-ray measurement
X-ray absorption

X-ray diffraction
X-ray reflection
X-ray scattering

Neutrinos

Neutrinos and antineutrinos

Electrons

Electrons
absorption
ionization
radiation
scattering
Electron theory
Positrons
Electron pairs
annihilation
production

Positronium
Beta-rays
absorption
angular distribution
detection, measurement
effects
scattering
Beta-ray spectra
Beta-ray spectrometers

Nucleons

Nucleons and antinucleons
scattering
scattering, nucleon-nucleon
interactions
antinucleons

Protons

Protons and antiprotons
 absorption
 angular distribution
 detection, measurement
 effects
 interactions
 magnetic moment
 polarization
 production
 scattering
 scattering, proton—deuteron
 scattering, proton—proton
 antiprotons
 Proton spectra

Neutrons

Neutrons and antineutrons
 absorption
 angular distribution
 detection, measurement
 diffusion
 effects
 interactions
 moderation
 polarization
 production
 reflection
 refraction
 scattering
 scattering, proton—neutron
 Neutron diffraction
 Neutron spectra
 Neutron spectrometers

Mesons

Mesons
 absorption
 capture
 decay
 decay observations
 detection, measurement
 effects
 interactions
 magnetic moment
 mass
 production
 scattering
 spin and parity
 Muonium
 Atoms, mesic

Hyperons

Hyperons
 absorption
 capture
 decay
 decay observations
 detection, measurement
 effects
 interactions
 magnetic moment
 mass
 production
 scattering
 spin and parity
 Hypernuclei
 Strange particles

Deuterons

Deuterons
 effects
 interactions
 photodisintegration
 polarization
 scattering

Tritons

Tritons

Alpha-particles, He Nuclei

Alpha-particles and He nuclei
 Alpha-rays
 absorption
 angular distribution
 detection, measurement
 effects
 scattering
 Alpha-ray spectra
 Alpha-ray spectrometers

COSMIC RAYS

Cosmic rays
 absorption
 apparatus
 composition
 alpha-particles
 deuterons
 electrons
 mesons

Cosmic rays
 neutrons
 photons
 protons
 effects and interactions
 origin
 primary
 showers and bursts
 variations

NUCLEUS

Beta-decay theory	Nuclear physics
Gyromagnetic ratio	Nucleus
Hypernuclei	electric moment
Mössbauer effect	energy levels
Nuclear decay theory	magnetic moment
Nuclear forces	models
Nuclear magnetic resonance	size
measurement [and relaxation]	spin and parity
Nuclear orientation	theory

Energy Levels . Excited nuclei

Gamma-ray spectra
Nuclear excitation
Nuclear isomerism
Nucleus
 energy levels
 models

NUCLEAR DECAY . RADIOACTIVITY

Alpha-particles and He nuclei	Beta-rays	Gamma-ray spectra	Radiation protection
Alpha-ray spectra	absorption	Gamma-ray spectrometers	Radioactive dating
Alpha-ray spectrometers	angular distribution	Gamma-rays	Radioactive tracers
Alpha-rays	detection, measurement	absorption	Radioactivity
absorption	effects	angular distribution	artificial production
angular distribution	scattering	detection, measurement	decay periods
detection, measurement	Biological effects of radiations	effects	decay schemes
effects	Chemical effect of radiations	internal conversion	electron capture
scattering	ionizing radiations	scattering	Radioactivity measurement
Beta-decay theory	Dosimetry	Nuclear decay theory	apparatus
Beta-ray spectra	Fallout	Physical effects of radiations	Radiochemistry
Beta-ray spectrometers		Radiation monitoring	

NUCLEAR REACTIONS

Alpha-rays	Gamma-rays	Nuclear reactions due to	Nuclear spallation
scattering	scattering	alpha-rays	Nucleons and antinucleons
Biological effects of radiations	Hyperons	cosmic rays	scattering
Chemical analysis	scattering	deuterons	Nucleus
by nuclear reactions	Mesons	electrons	models
Chemical effects of radiations	scattering	helium-3	theory
ionizing radiations	Neutrons and antineutrons	mesons	Photons
Collision processes	scattering	neutrons	scattering
Deuterons	Nuclear excitation	nuclei of $Z > 2$	Physical effects of radiations
scattering	Nuclear forces	photons	Protons and antiprotons
Electrons	Nuclear reactions	protons	scattering
scattering	chemical effects	tritons	Radiation monitoring
			Radiation protection
			Scattering, particles

Nuclear Fission

Nuclear fission
 products

Thermonuclear Reactions . Nuclear Fusion

Nuclear fusion
Thermonuclear reactions
Plasma

NUCLEAR POWER STUDIES

Biological effects of radiations	Nuclear reactions
Chemical analysis	chemical effects
by nuclear reactions	Nuclear reactors
Chemical effects of radiations	fission
ionizing radiations	fusion
Dosimetry	Physical effects of radiations
Nuclear fission	Plasma
products	Radiation monitoring
Nuclear fusion	Radiation protection
	Radiochemistry
	Thermonuclear reactions

ATOMIC AND MOLECULAR PHYSICS

Atoms
Collision processes
Constants
Molecules
Orbital calculation methods

ATOMS

Atoms
electron scattering
excitation
magnetic moment
structure
Atomic beams
Atomic mass

Atomic weight
Collision processes
Constants
Elements
origin
relative abundances

Gyromagnetic ratio
Ionization potential
Luminescence
gases
Optical pumping
Orbital calculation methods
Periodic system

Photoelectric emission
Spectra
atoms
Spectral line breadth
Stark effect
Zeeman effect

Isotopes

Isotope effects
Isotope exchanges
Isotope separation
Isotopes
detection
relative abundances

Mass spectra
Mass spectrometers
accessories
application
Tracers

Mesic Atoms

Atoms, mesic

MOLECULES

Molecules

Structure . Internal Mechanics . Spectra

Bonds
Chemical structure
Luminescence
gases
Molecular weight

Molecules
configuration and dimensions
inorganic
organic
excitation
internal mechanics
electronic structure
nuclear coupling
vibration and rotation
moments

Orbital calculation methods
Raman spectra
inorganic
organic
Spectra
continuous
flames
resonance
inorganic molecules
diatomic
diatomic, radiofrequency
polyatomic
polyatomic, radiofrequency

Spectra
inorganic liquids and solutions
inorganic solids
radiofrequency
organic molecules and substances
infrared
radiofrequency
Spectral line breadth
Stark effect
Valency
Zeeman effect

Magnetic Resonances

Magnetic resonance and relaxation
Molecules
nuclear coupling
relaxation

Nuclear magnetic resonance and relaxation
Nuclear quadrupole resonance
Paramagnetic resonance and relaxation

Dissociation . Free Radicals

Free radicals
Heat of dissociation
Molecules
dissociation
dissociation energies

Macromolecules . Polymers

Association
Heat of formation
Isomerism
Macromolecules
Polymers
Proteins

Intermolecular Mechanics

Collision processes
Molecular beams
Molecules
intermolecular mechanics

Mesic Molecules

Molecules, mesic

SOLID-STATE PHYSICS

Bonds
Crystals
 internal fields
Crystal properties
Equations of state
 solids
Metals
 theory

Mössbauer effect
Nuclear orientation
Orbital calculation methods
Solids
 structure
 theory
Surface energy
Surface phenomena

LATTICE MECHANICS

Absorption
 acoustic waves
 acoustic waves, ultrasonic
Acoustic wave propagation
 ultrasonic
Acoustoelectric effects
Crystals
 lattice mechanics

Diffraction
 acoustic waves
 acoustic waves, ultrasonic
Dispersion, acoustic
 ultrasonic
Magnetoacoustic effects
Mössbauer effect

Reflection
 acoustic waves
 acoustic waves, ultrasonic
Refraction
 acoustic waves
 acoustic waves, ultrasonic
Scattering
 acoustic waves
 acoustic waves, ultrasonic

Transmission
 acoustic waves
 acoustic waves, ultrasonic
Velocity
 acoustic waves
 acoustic waves, ultrasonic

Thermal Properties

Conductivity, thermal
 solids
Equations of state
 solids
Melting

Melting point
Specific heat
Thermal expansion
Thermodynamic properties

ELECTRON STATES

Crystal properties
Crystals
 electron states
 excitons
 internal fields
 polarons

Cyclotron resonance
Electron beams
 effects
Electron gas
Electron pairs
 annihilation

Electrons
 scattering
 absorption
 radiation
Hall effect
Magnetoacoustic effects

Metals
 theory
Piezoresistance
Solids
 theory
Surface phenomena

DEFECT PROPERTIES

Cold working
Creep
Crystals
 imperfections
 etching
 twinning
Crystal structure
Elastic deformation
Electron diffraction examination of materials
Electron microscope examination of materials

Heat treatment
Internal friction
Neutron diffraction examination of materials
Plastic deformation
Plastic flow
Slip
Stresses, internal
Work hardening
X-ray examination of materials
 microstructure

Diffusion

Diffusion in solids
Permeability, mechanical

Colour Centres

Absorption
 light
Colour centres
X-rays
 effects

Radiation effects

Acoustic waves
 effects
Alpha-rays
 effects
Beta-rays
 effects
Deuterons
 effects
Electron beams
 effects
Gamma-rays
 effects

Hyperons
 effects
Ion beams
 effects
Mesons
 effects
Neutrons
 effects
Physical effects of radiations
Protons
 effects
X-rays
 effects

ELECTRICAL PROPERTIES OF SOLIDS

Acoustoelectric effects
Conduction, electrical
Conductivity, electrical
measurement
Contact potential

Contact resistance
Crystals
electron states
Current, electrical
Eddy currents

Electron gas
Electro-optical effects
Fluctuations
electrical
Hall effect

Magnetoelectric effects
Magnetoresistance
Magnetothermal effects
Piezoresistance
Resistance, electrical
Space charge

Metals

Electron gas
Hall effect
Magnetoelectric effects
Magnetoresistance

Metals
theory
Piezoresistance
Skin effect

Semiconductors

Hall effect
Magnetoelectric effects
Magnetoresistance
Piezoresistance
Semiconductors

Semiconducting Materials

Semiconducting materials
germanium
indium antimonide
silicon

Semiconductor Devices

Counters
semiconductor
Semiconducting devices
diodes and junctions
transistors

Dielectrics

Breakdown, electric
solids
Contact potential
Dielectric devices
Dielectric measurement

Dielectric phenomena
Dielectric properties of
solids [substances]
Electrets
Electric charge
Electric fields

Electric strength
Electrostriction
Ferroelectric materials
Ferroelectric phenomena
Hysteresis
Piezoelectricity

Piezoelectric oscillations
Pyroelectricity
Relaxation
Rochelle salt
Space charge
Trielectricity

Photoconductivity. Photovoltaic effects

Photoconductivity
Photoelectricity
Photoelectromagnetic effects
Photovoltaic effects

Thermoelectric Properties

Thermocouples
Thermoelectricity

OPTICAL PROPERTIES OF SOLIDS

Absorption
light
Diffraction
light
Diffusion
light
Dispersion, optical
Double refraction
mechanical
Electro-optical effects
Interference
light
Magneto-optical effects

Masers
optical
Optical constants
Optical films
Optical materials
Optical pumping
Optical rotation
Optics
Photoelasticity
Pleochroism
Polarized light
Raman spectra
inorganic
organic

Reflection
light
Reflectivity
Refraction
light
Refractive index
light
Scattering
light
Spectra
continuous
inorganic solids
radiofrequency
organic molecules and
infrared [substances]
radiofrequency

Spectral line breadth
Stark effect
Transmission
light
Transparency
Velocity
light
X-ray spectra
absorption
emission
Zeeman effect

Luminescence

Colour centres
Electroluminescence
Luminescence
solids, inorganic
solids, organic
Luminescent devices
Thermoluminescence

MAGNETIC PROPERTIES OF SOLIDS

Antiferrimagnetism	Ferrimagnetism	Magnetic properties of substances	Magnetism
Antiferromagnetism	Ferrites	antiferrimagnetic	Magnetization process
de Haas—van Alphen effect	Ferromagnetism	antiferromagnetic	Magnetization state
Diamagnetism	Cyromagnetic ratio	diamagnetic	Magnetoacoustic effects
Electron diffraction examination	Hall effect	ferrimagnetic	Magnetolectric effects
[of materials]	Magnetic devices	ferromagnetic	Magnetoresistance
Electron microscope examination	Magnetic fields	paramagnetic	Magnetothermal effects
[of materials]	effects	transitions	Neutron diffraction examination
			Paramagnetism [of materials]
			Zeeman effect

Magnetic Resonances

Antiferrimagnetic resonance	Ferromagnetic relaxation	Magnetomechanical effects	Nuclear quadrupole resonance
Antiferromagnetic resonance	Ferromagnetic resonance	Masers	Optical pumping
Cyclotron resonance	Cyromagnetic effect	Nuclear magnetic resonance and	Paramagnetic resonance and
Ferrimagnetic resonance	Magnetic resonance and relaxation	measurement [relaxation]	measurement [relaxation]

MECHANICAL PROPERTIES OF SOLIDS

Abrasion	Elastic deformation	Lubrication	Strain gauges
Adhesion	Elastic fatigue	Magnetomechanical effects	Stress analysis
Bending	Elastic limit	Mechanical strength	Stress effects
Brittleness	Elastic relaxation	compressive	Stress/strain relations
Cold working	Elasticity	shear	Stresses, internal
Compressibility	Fracture	tensile	Thermoelasticity
Corrosion	Friction	Photoelasticity	Thixotropy
Cracks	Hardness	Physical effects of radiations	Torsion
Creep	Heat treatment	Plastic deformation	Viscoelasticity
Density	High-pressure phenomena and	Plastic flow	Wear
solids	Hysteresis [effects]	Plasticity	Work hardening
Elastic constants	Impact	Rheology	
measurement	Internal friction	Slip	

STRUCTURE OF SOLIDS

Crystal structure
Density
solids
Phase transformations
Solids
structure

CRYSTALLOGRAPHY

Crystal chemistry	Crystals	Crystals	Heat of crystallization
Crystal properties	electron states	internal fields	Minerals
Crystal structure	etching	lattice mechanics	Polymorphism
Crystallization	excitons	orientation	Solids
Crystallography	faces	polarons	structure
	growth	twinning	Surface texture
	imperfections	whiskers	

CRYSTAL LATTICE STRUCTURES

Crystal structure, atomic	Electron microscope examination	X-ray crystallography	X-ray examination of materials
elements	Neutron diffraction crystallography	apparatus	microstructure
inorganic compounds	Neutron diffraction examination	calculation apparatus	molecular structure
organic compounds	X-ray absorption	calculation methods	X-ray measurement
Electron diffraction crystallography		technique	X-ray monochromators
Electron diffraction examination		X-ray diffraction	X-ray reflection
			X-ray scattering
			X-ray tubes

ALLOYS . METALLURGY

Alloys	Heat of crystallization	Phase equilibrium	Solubility
Cold working	Heat treatment	Phase transformations	Steel
Crystallization	Metallurgy	Precipitation	Thermal transformations
Crystal structure	Metals	Sintering	Work hardening
Crystal structure, atomic	theory	Solid solutions	Zone melting and refining
alloys			

OTHER SOLID FORMS

Amorphous state
Fibres
Filters
Glass

Granular structure
Membranes
Particle size
Permeability, mechanical

Plastics
Polymers
Porous materials
Powders

Rubber
Sintering
Vitreous state
Waxes

Surfaces . Films . Adsorption

Surface energy
Surface measurement
Surface phenomena
Surface texture
Evaporation
Films
solid

Sputtering
Sublimation
Adsorption
Adsorbed layers
Heat of adsorption
Sorption

MICROSTRUCTURE EXAMINATION

Amorphous state
Electron diffraction examination
Electron microscope examination
Electron microscopy
Fibres

Granular structure
Ion microscopes
Microscopy
Neutron diffraction examination

Particle size
Powders
Porous materials
Radiography
Surface texture

Vitreous state
X-ray examination of materials
microstructure
molecular structure

PHYSICAL CHEMISTRY

Atomic weight
Balances
Bonds
Centrifuges
Chemical structure
Chemical technology

Distillation
Elements
origin
relative abundances
Filters
Isomerism

Laboratory apparatus and
Macromolecules [technique
Molecular weight
Molecular weight determination
Periodic system
Physical chemistry

Precipitation
Pumps
Quantum chemistry
Sedimentation
Valency

THERMOCHEMISTRY . REACTIONS

Association
gases
liquids
Catalysis
Chemical reactions
Combustion
Corrosion

Crystal chemistry
Detonation
Dissociation
Exchanges, chemical
Explosions
Flames

Heat of adsorption
Heat of combustion
Heat of dissociation
Heat of formation
Heat of reaction
Isotope exchanges
Oxidation

Phase equilibrium
Phase transformations
Polymerization
Polymers
Reaction kinetics
Sorption
Thermal transformations

ELECTROCHEMISTRY

Conductivity, electrical
electrolytic
measurement

Dissociation
electrolytic
Electrochemistry
electrodes

Electrokinetic effects
Electrolysis
Electrolytic deposition

Electrophoresis
Ion velocity
electrolytic
Ions, electrolytic

PHOTOCHEMISTRY**RADIATION CHEMISTRY****RADIOCHEMISTRY**

Chemical effects of radiations
acoustic waves
ionizing radiations

Nuclear reactions
chemical effects
Photochemistry
Radiochemistry

DISPERSIONS . COLLOIDS

Aerosols
Centrifuges
Colloids
Electrophoresis
Emulsions

Filters
Foams
Gels
Heat of solution
Membranes

Osmosis
Particle size
Precipitation
Sedimentation
Sols

Solubility
Solutions
Surface phenomena
Suspensions
Thixotropy

PHYSICAL METHODS OF CHEMICAL ANALYSIS

Chemical analysis
adsorption
by mass spectrometry
by nuclear reactions
electrochemical
radioactive
X-ray

Chromatography
Radioactive tracers
Spectrochemical analysis
Tracers

GEOFYSICS

Earth	Geodesy	Gravity	Radioactivity
age	Geophysical prospecting	Minerals	Seawater
composition	Geophysics	Oceanography	Seismic waves
electricity	Glaciers	Radioactive dating	Seismology
heat			
rotation			

ATMOSPHERE

Altimeters	Atmospheric acoustics	Evaporation	Rain
Anemometers	Atmospheric electricity	Fallout	Rockets
Atmosphere	Atmospheric optics	Fog	Satellites, artifical
composition	Atmospheric pressure and	Humidity	Sky brightness
humidity	[density]	Hygrometers	Snow
movements	Atmospheric spectra	Ice	Sunlight
precipitation	Atmospherics	Lightning	Thunderstorms
radioactivity	Clouds	Meteorological instruments	Twilight
structure	Condensation	Meteorology	Weather
temperature			Wind
thermodynamics			

UPPER ATMOSPHERE . IONOSPHERE

Airglow	Atmospheric electricity	Atmospherics	Ionization, atmosphere
Altimeters	Atmospheric optics	Aurora	Meteors
Atmosphere	Atmospheric pressure and	Fallout	Rockets
composition	[density]	Ionosphere	Satellites, artifical
movements	Atmospheric spectra	D-region	Sky brightness
radioactivity		E-region	Sunlight
radiation belts		F-region	Twilight
structure		Ionosphere measuring apparatus	Zodiacal light
temperature			
thermodynamics			
upper			

GEOMAGNETISM

Compasses	Magnetic storms
Earth	Magnetism
magnetic field	Rock magnetism
magnetic field, variations	

ASTROPHYSICS

Astronomical instruments	Elements	Moon	Sun
Astronomical observations	origin	Nebulae	corona
Astronomical spectra	relative abundances	Novae	flares
Astronomy and astrophysics	Galaxies	Planets	magnetism
Celestial mechanics	Gravitation	Solar system	prominences
Comets	Interplanetary magnetic field	Stars	radiation
Cosmic rays	Interplanetary matter	composition	spectra
Cosmology	Interstellar matter	magnetism	Sunspots
Earth	Magnetohydrodynamics	radiation	Telescopes
rotation	Meteors	spectra	astronomical
Eclipses		structure	Thermonuclear reactions
			Zodiacal light

Radioastronomy

Cosmic radiations, r.f.
Radioastronomy
Sun
radiation, r.f.

Space Research

Rockets
Satellites, artifical
Space research
Space vehicles
instrumentation

BIOPHYSICS . PHYSIOLOGICAL PHYSICS

Biological effects of radiations
 acoustic waves
 ionizing radiations
 Biological technique and instruments
 Biology
 Biophysics
 Blood
 Bone

Dosimetry
 Medical science
 Physiology
 Proteins
 Radiation protection
 Radiography
 Zoology

Hearing . Speech

Ear
 Hearing
 Hearing aids
 Noise
 Speech

Vision

Eye
 Vision
 Colour vision
 Stereoscopy

TECHNIQUE . MATERIALS

Biological technique and instruments
 Chemical technology
 Laboratory apparatus and technique
 Leak detection

Low-temperature technique
 Metallurgy
 Vacuum technique
 Zone melting and refining
 Materials

All the chemical elements are listed by name, followed by their compounds and alloys. Organic compounds are grouped under the headings "Organic compounds", "Polymers", "Plastics". In addition, there are also the following general headings:

Actinides
 Actinide compounds
 Alkali metals
 Alkali metal compounds
 Alkaline earth metals
 Alkaline earth compounds
 Alloys
 Ceramics
 Ferrites
 Ferroelectric materials
 Fibres
 Garnets
 Halogens

Inert gases
 Metals
 Minerals
 Optical materials
 Porous materials
 Powders
 Proteins
 Rare earth metals
 Rare earth compounds
 Semiconductors
 Semiconducting materials
 Transition metals
 Transition metal compounds
 Waxes

as well as the following special substance headings:

Air
 Blood
 Bone
 Clay
 Coal
 Concrete
 Deuterium
 Diamonds
 Gelatin
 Glass
 Graphite
 Ice
 Mica

Ozone
 Paper
 Quartz
 Rochelle salt
 Rubber
 Sand
 Seawater
 Soil
 Steam
 Steel
 Tritium
 Water
 Wood